00:00:00.000 --> 00:00:03.225 Hello everyone. Welcome to RT32.

00:00:03.225 --> 00:00:05.805 Presentation I mean sorry,

00:00:05.810 --> 00:00:06.814 excuse me well oops,

00:00:06.814 --> 00:00:08.616 that's a I'm I'm ready for the

00:00:08.616 --> 00:00:10.296 next thing that I'm going to do.

00:00:10.300 --> 00:00:13.302 Welcome to our grand rounds and

00:00:13.302 --> 00:00:15.262 it's my pleasure to introduce

00:00:15.262 --> 00:00:16.830 Doctor Jamie in Portland.

00:00:16.830 --> 00:00:18.370 I've known Jamie for into

00:00:18.370 --> 00:00:20.523 our second decade and were Co

00:00:20.523 --> 00:00:22.167 conspirators in electrophysiology.

00:00:22.170 --> 00:00:24.468 We've collaborated at a fun time.

00:00:24.470 --> 00:00:27.366 I consider him a colleague and a friend

00:00:27.370 --> 00:00:31.375 and so he'll be speaking to you about his.

NOTE Confidence: 0.862330445555556

00:00:31.380 --> 00:00:34.254 He's a really impactful work progress

NOTE Confidence: 0.862330445555556

00:00:34.254 --> 00:00:36.170 in biomarkers and development

NOTE Confidence: 0.862330445555556

00:00:36.246 --> 00:00:37.870 in autism spectrum disorder.

NOTE Confidence: 0.862330445555556

00:00:37.870 --> 00:00:39.830 It's really, you know,

NOTE Confidence: 0.862330445555556

00:00:39.830 --> 00:00:42.422 an amazing program of research and

NOTE Confidence: 0.862330445555556

00:00:42.422 --> 00:00:44.630 it's you know, world renowned.

NOTE Confidence: 0.862330445555556

00:00:44.630 --> 00:00:46.450 Before we get started,

NOTE Confidence: 0.862330445555556

00:00:46.450 --> 00:00:48.331 I just want to remind you that we have

NOTE Confidence: 0.862330445555556

00:00:48.331 --> 00:00:50.047 another imperson grand rounds next week,

NOTE Confidence: 0.862330445555556

00:00:50.050 --> 00:00:52.829 and that's going to be Teresa Betancourt

NOTE Confidence: 0.862330445555556

00:00:52.830 --> 00:00:55.044 and the title of her talk will be the

NOTE Confidence: 0.862330445555556

00:00:55.044 --> 00:00:56.769 promise of implementation science.

NOTE Confidence: 0.862330445555556

00:00:56.770 --> 00:00:58.730 Promotion of ECD play and

NOTE Confidence: 0.862330445555556

00:00:58.730 --> 00:01:00.298 violence reduction in Rwanda.

NOTE Confidence: 0.862330445555556

00:01:00.300 --> 00:01:01.400 So without further ado.

NOTE Confidence: 0.862330445555556

00:01:01.400 --> 00:01:01.950 Talking Portland

NOTE Confidence: 0.894939993636364

00:01:06.370 --> 00:01:08.238 thank you Mike. OK,

NOTE Confidence: 0.894939993636364

00:01:08.238 --> 00:01:11.770 the I'm certain for me at least.

NOTE Confidence: 0.894939993636364

00:01:11.770 --> 00:01:14.560 The hardest part of today is

NOTE Confidence: 0.894939993636364

00:01:14.560 --> 00:01:17.377 going to be figuring out how

NOTE Confidence: 0.894939993636364

00:01:17.377 --> 00:01:19.260 to share my screen. Yeah.

NOTE Confidence: 0.87003039875

00:01:23.300 --> 00:01:27.708 Alright well that kinda. From what you see.

NOTE Confidence: 0.968346586666667

00:01:30.940 --> 00:01:32.388 Alright, we're in business.

NOTE Confidence: 0.968346586666667

00:01:32.388 --> 00:01:34.198 So thank you so much.

NOTE Confidence: 0.968346586666667

00:01:34.200 --> 00:01:35.970 It's really it's very special to

NOTE Confidence: 0.968346586666667

00:01:35.970 --> 00:01:38.400 me to be here today and have the

NOTE Confidence: 0.968346586666667

00:01:38.400 --> 00:01:40.562 chance to talk to you about the

NOTE Confidence: 0.968346586666667

00:01:40.562 --> 00:01:42.488 the work that we've been doing.

NOTE Confidence: 0.968346586666667

00:01:42.490 --> 00:01:44.210 I I looked back in the first time

NOTE Confidence: 0.968346586666667

00:01:44.210 --> 00:01:45.930 that I ever gave grand Rounds.

NOTE Confidence: 0.968346586666667

00:01:45.930 --> 00:01:48.134 Here was in 2008.

NOTE Confidence: 0.968346586666667

00:01:48.134 --> 00:01:50.430 I was a research faculty.

NOTE Confidence: 0.968346586666667

00:01:50.430 --> 00:01:52.350 I was not yet an assistant

NOTE Confidence: 0.968346586666667

00:01:52.350 --> 00:01:53.440 professor and really,

NOTE Confidence: 0.968346586666667

00:01:53.440 --> 00:01:54.890 my entire career has happened

NOTE Confidence: 0.968346586666667

00:01:54.890 --> 00:01:56.780 here at the CHILD Study Center.

NOTE Confidence: 0.968346586666667

00:01:56.780 --> 00:01:57.902 So it's really.

NOTE Confidence: 0.968346586666667

00:01:57.902 --> 00:02:00.945 It's fun for me and it's meaningful to

NOTE Confidence: 0.968346586666667

00:02:00.945 --> 00:02:03.745 be introduced by Mike to have the faces.

NOTE Confidence: 0.968346586666667

00:02:03.750 --> 00:02:04.644 In the audience,

NOTE Confidence: 0.968346586666667

00:02:04.644 --> 00:02:07.090 be the very people that trained me here,

NOTE Confidence: 0.968346586666667

00:02:07.090 --> 00:02:09.124 and I assume there hopefully face

NOTE Confidence: 0.968346586666667

00:02:09.124 --> 00:02:10.870 staring computer screens out there.

NOTE Confidence: 0.968346586666667

00:02:10.870 --> 00:02:12.718 So thank you for today and

NOTE Confidence: 0.968346586666667

00:02:12.718 --> 00:02:13.950 thank you for everything.

NOTE Confidence: 0.968346586666667

00:02:13.950 --> 00:02:15.326 And it's fun to talk about this stuff.

NOTE Confidence: 0.968346586666667

00:02:15.330 --> 00:02:15.625 Really.

NOTE Confidence: 0.968346586666667

00:02:15.625 --> 00:02:17.395 What I'm going to talk about,

NOTE Confidence: 0.968346586666667

00:02:17.400 --> 00:02:19.204 his progress in biomarker

NOTE Confidence: 0.968346586666667

00:02:19.204 --> 00:02:20.557 development in autism.

NOTE Confidence: 0.968346586666667

00:02:20.560 --> 00:02:21.439 The you know,

NOTE Confidence: 0.968346586666667

00:02:21.439 --> 00:02:22.904 I don't think there's conflicts.

NOTE Confidence: 0.968346586666667

00:02:22.910 --> 00:02:24.470 These are the organizations and

NOTE Confidence: 0.968346586666667

00:02:24.470 --> 00:02:26.250 support my lab and support me,

NOTE Confidence: 0.968346586666667

00:02:26.250 --> 00:02:27.538 but I don't think there's any conflicts.

NOTE Confidence: 0.968346586666667

00:02:27.540 --> 00:02:28.812 Will talk about today in terms

NOTE Confidence: 0.968346586666667

00:02:28.812 --> 00:02:30.055 of the content and this is

NOTE Confidence: 0.968346586666667

00:02:30.055 --> 00:02:31.266 what I want to try to cover.

NOTE Confidence: 0.968346586666667

00:02:31.270 --> 00:02:33.034 It's a lot I want to talk

NOTE Confidence: 0.968346586666667

00:02:33.034 --> 00:02:34.729 a little bit about autism.

NOTE Confidence: 0.968346586666667

00:02:34.730 --> 00:02:36.962 People know a lot about autism in this room.

NOTE Confidence: 0.968346586666667

00:02:36.970 --> 00:02:38.506 Some of the things that are

NOTE Confidence: 0.968346586666667

00:02:38.506 --> 00:02:40.383 really central to me and how to

NOTE Confidence: 0.968346586666667

00:02:40.383 --> 00:02:41.713 approach the study of autism.

NOTE Confidence: 0.968346586666667

00:02:41.720 --> 00:02:43.768 I want to talk a little bit about

NOTE Confidence: 0.968346586666667

00:02:43.768 --> 00:02:45.369 biomarker but biomarker research,

NOTE Confidence: 0.968346586666667

00:02:45.370 --> 00:02:47.070 how we operationalize biomarkers

NOTE Confidence: 0.968346586666667

00:02:47.070 --> 00:02:49.195 'cause I think there's some

NOTE Confidence: 0.968346586666667

00:02:49.195 --> 00:02:51.669 really some kind of problematic

NOTE Confidence: 0.968346586666667

00:02:51.669 --> 00:02:53.649 misunderstandings and simply and

NOTE Confidence: 0.968346586666667

00:02:53.649 --> 00:02:55.850 simplifications that trouble our field.

NOTE Confidence: 0.968346586666667

00:02:55.850 --> 00:02:57.537 I want to talk about some of

NOTE Confidence: 0.968346586666667

00:02:57.537 --> 00:02:59.604 the things that I worry about

NOTE Confidence: 0.968346586666667

00:02:59.604 --> 00:03:00.885 in evaluating biomarkers

NOTE Confidence: 0.968346586666667

00:03:00.885 --> 00:03:02.166 scientifically and practically.

NOTE Confidence: 0.968346586666667

00:03:02.170 --> 00:03:04.807 And then I'm gonna tell a story of progress.

NOTE Confidence: 0.968346586666667

00:03:04.810 --> 00:03:06.366 With a particular biomarker,

00:03:06.366 --> 00:03:09.189 and 170 but I've been very involved

00:03:09.189 --> 00:03:11.691 with and then some obstacles to

00:03:11.691 --> 00:03:13.802 moving forward and then some paths

00:03:13.802 --> 00:03:15.559 forward so you know that I put

00:03:15.559 --> 00:03:17.669 into the category of kind of better

00:03:17.669 --> 00:03:19.586 studies and a particular one that

00:03:19.586 --> 00:03:21.554 I'll talk about is the Autism

00:03:21.554 --> 00:03:23.461 Biomarkers Consortium for clinical trials,

00:03:23.461 --> 00:03:25.546 and then ways to innovate

00:03:25.550 --> 00:03:27.130 to look beyond just autism.

00:03:27.130 --> 00:03:29.185 Way that biomarkers could be

00:03:29.185 --> 00:03:30.829 informative and transdiagnostic ways

00:03:30.829 --> 00:03:33.344 to increase the reach of neuroscience

00:03:33.344 --> 00:03:35.164 research in autism, which is.

00:03:35.164 --> 00:03:36.946 Presently limited and then how we

00:03:36.946 --> 00:03:39.482 might be able to use some of these

NOTE Confidence: 0.968346586666667

00:03:39.482 --> 00:03:41.540 biomarkers to actually inform therapeutics,

NOTE Confidence: 0.968346586666667

00:03:41.540 --> 00:03:43.328 which is the goal.

NOTE Confidence: 0.968346586666667

00:03:43.330 --> 00:03:44.318 Is that a question?

NOTE Confidence: 0.94230175

00:03:46.970 --> 00:03:47.480 Sure.

NOTE Confidence: 0.882743902352941

00:03:52.680 --> 00:03:54.045 These are all these are the graphs

NOTE Confidence: 0.882743902352941

00:03:54.045 --> 00:03:55.079 that have supported the research

NOTE Confidence: 0.882743902352941

00:03:55.079 --> 00:03:56.330 that you hear about today, yeah?

NOTE Confidence: 0.78055227

00:04:04.270 --> 00:04:07.730 Thanks Paul. Yeah yeah.

NOTE Confidence: 0.78055227

00:04:07.730 --> 00:04:10.190 So autism spectrum disorder.

NOTE Confidence: 0.78055227

00:04:10.190 --> 00:04:12.128 So the DSM five defines autism

NOTE Confidence: 0.78055227

00:04:12.128 --> 00:04:13.957 spectrum disorder as a developmental

NOTE Confidence: 0.78055227

00:04:13.957 --> 00:04:16.297 condition that impacts you know,

NOTE Confidence: 0.78055227

00:04:16.300 --> 00:04:17.684 they group it in two areas that we

NOTE Confidence: 0.78055227

00:04:17.684 --> 00:04:18.937 could think of it as kind of three.

NOTE Confidence: 0.78055227

00:04:18.940 --> 00:04:21.433 I think about it as kind of three social

NOTE Confidence: 0.78055227

00:04:21.433 --> 00:04:23.103 communicated function interests and

NOTE Confidence: 0.78055227

00:04:23.103 --> 00:04:25.328 behavioral flexibility and sensory responses.

NOTE Confidence: 0.78055227

00:04:25.330 --> 00:04:26.878 And I want to highlight when

NOTE Confidence: 0.78055227

00:04:26.878 --> 00:04:27.910 we say developmental condition,

NOTE Confidence: 0.78055227

00:04:27.910 --> 00:04:30.304 one of the challenges of studying autism

NOTE Confidence: 0.78055227

00:04:30.304 --> 00:04:33.238 is that you it's always a moving target.

NOTE Confidence: 0.78055227

00:04:33.240 --> 00:04:35.600 So whenever we look at anything in autism,

NOTE Confidence: 0.78055227

00:04:35.600 --> 00:04:36.713 behavior or brain.

NOTE Confidence: 0.78055227

00:04:36.713 --> 00:04:39.310 We don't really know whether we see

NOTE Confidence: 0.78055227

00:04:39.385 --> 00:04:42.025 are seeing A cause of autism or a

NOTE Confidence: 0.78055227

00:04:42.025 --> 00:04:44.559 consequence of developing with autism, right?

NOTE Confidence: 0.78055227

00:04:44.559 --> 00:04:45.435 So that's really important

NOTE Confidence: 0.78055227

00:04:45.435 --> 00:04:46.790 for us to keep in mind.

NOTE Confidence: 0.78055227

00:04:46.790 --> 00:04:48.589 What are the other things that I

NOTE Confidence: 0.78055227

00:04:48.589 --> 00:04:50.640 think are really important to keep in

NOTE Confidence: 0.78055227

00:04:50.640 --> 00:04:52.470 mind when we're talking about autism?

NOTE Confidence: 0.78055227

00:04:52.470 --> 00:04:53.080 Heterogeneity, right?

NOTE Confidence: 0.78055227

00:04:53.080 --> 00:04:54.605 So when you say autism,

NOTE Confidence: 0.78055227

00:04:54.610 --> 00:04:56.778 you really don't know too much about the

NOTE Confidence: 0.78055227

00:04:56.778 --> 00:04:58.705 person that you're talking about, right?

NOTE Confidence: 0.78055227

00:04:58.705 --> 00:05:00.365 They could have an IQ of 150,

NOTE Confidence: 0.78055227

00:05:00.365 --> 00:05:02.325 an IQ of 50 could have fluent language,

NOTE Confidence: 0.78055227

00:05:02.330 --> 00:05:04.214 could have no language.

NOTE Confidence: 0.78055227

00:05:04.214 --> 00:05:06.098 We know one thing.

NOTE Confidence: 0.78055227

00:05:06.100 --> 00:05:08.348 We know that they have some kind of

NOTE Confidence: 0.78055227

00:05:08.348 --> 00:05:10.080 difficulties with social communication,

NOTE Confidence: 0.78055227

00:05:10.080 --> 00:05:10.343 right?

NOTE Confidence: 0.78055227

00:05:10.343 --> 00:05:11.921 That is literally when we think

NOTE Confidence: 0.78055227

00:05:11.921 --> 00:05:13.190 by the diagnostic criteria.

NOTE Confidence: 0.78055227

00:05:13.190 --> 00:05:14.690 The only thing that you can

NOTE Confidence: 0.78055227

00:05:14.690 --> 00:05:16.533 take as a safe assumption about

00:05:16.533 --> 00:05:18.488 any given person with autism.

00:05:18.490 --> 00:05:20.434 And that's where we choose to dig it.

00:05:20.440 --> 00:05:22.200 And we think maybe will get the most

00:05:22.200 --> 00:05:23.728 traction and understanding a really,

00:05:23.730 --> 00:05:26.315 really complicated condition by focusing

00:05:26.315 --> 00:05:30.480 on that area of of common difficulty

00:05:30.480 --> 00:05:33.160 when we think about the biology of autism,

00:05:33.160 --> 00:05:34.624 it's not well understood,

00:05:34.624 --> 00:05:36.088 but we do understand.

00:05:36.090 --> 00:05:38.130 Is that there's multiple causes.

00:05:38.130 --> 00:05:40.375 There's probably many different kinds

00:05:40.375 --> 00:05:42.620 of mechanisms involved in autism.

00:05:42.620 --> 00:05:45.530 Autism isn't a biological thing,

00:05:45.530 --> 00:05:45.770 right?

00:05:45.770 --> 00:05:47.930 So I'm going to talk to you today about

00:05:47.983 --> 00:05:49.921 how to make biomarkers for something

NOTE Confidence: 0.78055227

00:05:49.921 --> 00:05:52.209 that isn't one biological thing challenging,

NOTE Confidence: 0.78055227

00:05:52.210 --> 00:05:52.812 right?

NOTE Confidence: 0.78055227

00:05:52.812 --> 00:05:57.273 So if we have these these in that situation,

NOTE Confidence: 0.78055227

00:05:57.273 --> 00:05:58.678 what are we left with?

NOTE Confidence: 0.78055227

00:05:58.680 --> 00:06:00.290 Or we're left with behavior,

NOTE Confidence: 0.78055227

00:06:00.290 --> 00:06:03.195 and so everything really everything

NOTE Confidence: 0.78055227

00:06:03.195 --> 00:06:06.100 that we use as clinicians.

NOTE Confidence: 0.78055227

00:06:06.100 --> 00:06:07.948 To make decisions about autism is

NOTE Confidence: 0.78055227

00:06:07.948 --> 00:06:10.432 based on behavior and let me let me

NOTE Confidence: 0.78055227

00:06:10.432 --> 00:06:12.214 highlight this by showing you pictures.

NOTE Confidence: 0.78055227

00:06:12.220 --> 00:06:14.980 So in the lab there's many,

NOTE Confidence: 0.78055227

00:06:14.980 --> 00:06:16.630 many different tools that we

NOTE Confidence: 0.78055227

00:06:16.630 --> 00:06:18.280 can use for our science.

NOTE Confidence: 0.78055227

00:06:18.280 --> 00:06:20.600 We can use electrophysiology,

NOTE Confidence: 0.78055227

00:06:20.600 --> 00:06:22.340 positron emission tomography,

NOTE Confidence: 0.78055227

00:06:22.340 --> 00:06:24.720 functional near infrared spectroscopy,

NOTE Confidence: 0.78055227

00:06:24.720 --> 00:06:25.910 eye tracking,

NOTE Confidence: 0.78055227

00:06:25.910 --> 00:06:28.620 lots of different powerful techniques

NOTE Confidence: 0.78055227

00:06:28.620 --> 00:06:32.040 to learn different things about biology.

NOTE Confidence: 0.78055227

00:06:32.040 --> 00:06:34.680 When we go into the clinic and This

NOTE Confidence: 0.78055227

00:06:34.680 --> 00:06:36.725 is why I show these slides a lot.

NOTE Confidence: 0.78055227

00:06:36.730 --> 00:06:38.770 Today I feel these slides.

NOTE Confidence: 0.78055227

00:06:38.770 --> 00:06:40.968 I came here directly from the clinic

NOTE Confidence: 0.78055227

00:06:40.968 --> 00:06:43.388 and there is a family that I we

NOTE Confidence: 0.78055227

00:06:43.388 --> 00:06:45.570 worked with today that is struggling.

NOTE Confidence: 0.78055227

00:06:45.570 --> 00:06:48.474 A child who is struggling and you

NOTE Confidence: 0.78055227

00:06:48.474 --> 00:06:51.162 know what can't use single one of

NOTE Confidence: 0.78055227

00:06:51.162 --> 00:06:53.548 these things to help this family.

NOTE Confidence: 0.78055227

00:06:53.550 --> 00:06:57.056 What have I got? I've got my eyes.

NOTE Confidence: 0.78055227

00:06:57.056 --> 00:06:58.977 I've got the parents eyes and what

NOTE Confidence: 0.78055227

00:06:58.977 --> 00:07:00.895 they can tell me about that child.

NOTE Confidence: 0.78055227

00:07:00.900 --> 00:07:03.525 This literally the same tool

NOTE Confidence: 0.78055227

00:07:03.525 --> 00:07:06.150 that Lee O'Connor was using

NOTE Confidence: 0.901603751818182

00:07:06.252 --> 00:07:09.219 in 1943, and that like those two pictures,

NOTE Confidence: 0.901603751818182

00:07:09.220 --> 00:07:11.060 that's it. That's the goal of the lab

NOTE Confidence: 0.901603751818182

00:07:11.060 --> 00:07:13.331 is to try to get some of those tools to

NOTE Confidence: 0.901603751818182

00:07:13.331 --> 00:07:15.595 help us do a better job helping families.

NOTE Confidence: 0.901603751818182

00:07:15.600 --> 00:07:17.476 'cause I think that we can do.

NOTE Confidence: 0.901603751818182

00:07:17.480 --> 00:07:18.356 We've done great.

NOTE Confidence: 0.901603751818182

00:07:18.356 --> 00:07:20.067 Don't get me wrong like clinicians,

NOTE Confidence: 0.901603751818182

00:07:20.067 --> 00:07:22.043 you know, I said a place like this.

NOTE Confidence: 0.901603751818182

00:07:22.050 --> 00:07:23.875 Clinicians are powerful and they

NOTE Confidence: 0.901603751818182

00:07:23.875 --> 00:07:26.297 can do great things, but I think.

NOTE Confidence: 0.901603751818182

00:07:26.297 --> 00:07:28.530 There are inherent limitations to what we

NOTE Confidence: 0.901603751818182

00:07:28.595 --> 00:07:31.079 can see and what parents can see and when.

NOTE Confidence: 0.901603751818182

00:07:31.080 --> 00:07:33.456 That's the only thing guiding us.

00:07:33.460 --> 00:07:34.762 I don't think that we're doing

00:07:34.762 --> 00:07:36.616 the best we can possibly do the.

00:07:36.616 --> 00:07:39.300 So what we want. We want biomarkers.

00:07:39.300 --> 00:07:40.660 What is a biomarker?

00:07:40.660 --> 00:07:43.340 This is how the FDA defines a biomarker,

00:07:43.340 --> 00:07:45.895 a characteristic that is measured as an

00:07:45.895 --> 00:07:48.359 indicator of normal biological processes,

00:07:48.360 --> 00:07:50.096 pathogenic processes or responses

00:07:50.096 --> 00:07:52.266 to an exposure or intervention,

00:07:52.270 --> 00:07:53.290 including therapeutic interventions.

00:07:53.290 --> 00:07:56.170 So a lot of words kind of jargony,

00:07:56.170 --> 00:07:57.778 but think about it. What does it mean?

00:07:57.780 --> 00:07:59.890 It's basically something about biology

00:07:59.890 --> 00:08:02.163 that can be objectively measured, right?

00:08:02.163 --> 00:08:03.630 But I think that's what I think about it.

00:08:03.630 --> 00:08:05.212 So like a picture of what a

NOTE Confidence: 0.901603751818182

00:08:05.212 --> 00:08:05.890 biomarker should be,

NOTE Confidence: 0.901603751818182

00:08:05.890 --> 00:08:07.568 it would be a picture of a ruler, right?

NOTE Confidence: 0.901603751818182

00:08:07.568 --> 00:08:09.234 Something is objective that you can measure,

NOTE Confidence: 0.901603751818182

00:08:09.240 --> 00:08:10.398 and when two people use it,

NOTE Confidence: 0.901603751818182

00:08:10.400 --> 00:08:12.680 it gives you the same result.

NOTE Confidence: 0.901603751818182

00:08:12.680 --> 00:08:15.900 You can't, people do, but you can't.

NOTE Confidence: 0.901603751818182

00:08:15.900 --> 00:08:18.912 You shouldn't promise me that you

NOTE Confidence: 0.901603751818182

00:08:18.912 --> 00:08:21.569 won't think about biomarkers in the.

NOTE Confidence: 0.901603751818182

00:08:21.570 --> 00:08:24.342 Dissociated from their purpose a biomarker

NOTE Confidence: 0.901603751818182

00:08:24.342 --> 00:08:27.023 could only be meaningfully considered when

NOTE Confidence: 0.901603751818182

00:08:27.023 --> 00:08:30.071 you think about what you're using it for,

NOTE Confidence: 0.901603751818182

00:08:30.080 --> 00:08:31.550 so these are the kinds of

NOTE Confidence: 0.901603751818182

00:08:31.550 --> 00:08:33.010 categories of use of the FDA.

NOTE Confidence: 0.901603751818182

00:08:33.010 --> 00:08:34.875 Defines there are additional ones

NOTE Confidence: 0.901603751818182

00:08:34.875 --> 00:08:37.417 I've limited to these that that I

NOTE Confidence: 0.901603751818182

00:08:37.417 --> 00:08:39.545 think of as being relevant to autism,

NOTE Confidence: 0.901603751818182

00:08:39.550 --> 00:08:41.854 so one would be susceptibility or

NOTE Confidence: 0.901603751818182

00:08:41.854 --> 00:08:43.390 risk something biological that

NOTE Confidence: 0.901603751818182

00:08:43.450 --> 00:08:45.430 you measure that tells you that

NOTE Confidence: 0.901603751818182

00:08:45.430 --> 00:08:47.254 someone is an increased likelihood

NOTE Confidence: 0.901603751818182

00:08:47.254 --> 00:08:49.030 of developing a condition.

NOTE Confidence: 0.901603751818182

00:08:49.030 --> 00:08:50.585 Pharmacodynamic or response or another

NOTE Confidence: 0.901603751818182

00:08:50.585 --> 00:08:53.319 way to put it would be target engagement,

NOTE Confidence: 0.901603751818182

00:08:53.320 --> 00:08:53.769 right?

NOTE Confidence: 0.901603751818182

00:08:53.769 --> 00:08:57.361 A biomarker that tells you a treatment is

NOTE Confidence: 0.901603751818182

00:08:57.361 --> 00:09:00.099 activating a certain system in the body.

NOTE Confidence: 0.901603751818182

00:09:00.100 --> 00:09:02.205 Prognostic something that tells you

NOTE Confidence: 0.901603751818182

00:09:02.205 --> 00:09:05.190 about the natural course of a condition,

NOTE Confidence: 0.901603751818182

00:09:05.190 --> 00:09:06.621 right how things,

NOTE Confidence: 0.901603751818182

00:09:06.621 --> 00:09:08.529 how development will unfold.

NOTE Confidence: 0.901603751818182

00:09:08.530 --> 00:09:11.242 Predictive something that tells you about

NOTE Confidence: 0.901603751818182

00:09:11.242 --> 00:09:14.180 an anticipated response to an intervention.

NOTE Confidence: 0.901603751818182

00:09:14.180 --> 00:09:16.232 Who's going to do better with this kind of

NOTE Confidence: 0.901603751818182

00:09:16.232 --> 00:09:17.819 treatment versus that kind of treatment?

NOTE Confidence: 0.901603751818182

00:09:17.820 --> 00:09:20.128 And then lastly diagnostic.

NOTE Confidence: 0.901603751818182

00:09:20.128 --> 00:09:23.860 And this is what you know when people

NOTE Confidence: 0.901603751818182

00:09:23.860 --> 00:09:25.635 think about biomarkers and autism.

NOTE Confidence: 0.901603751818182

00:09:25.640 --> 00:09:26.286 Problematically,

NOTE Confidence: 0.901603751818182

00:09:26.286 --> 00:09:29.516 almost everybody thinks about a

NOTE Confidence: 0.901603751818182

00:09:29.516 --> 00:09:31.654 diagnostic biomarker and what

NOTE Confidence: 0.901603751818182

00:09:31.654 --> 00:09:34.762 they think about is a diagnostic

NOTE Confidence: 0.901603751818182

00:09:34.762 --> 00:09:37.218 biomarker for the condition,

NOTE Confidence: 0.901603751818182

00:09:37.220 --> 00:09:38.288 right that this biomarker

NOTE Confidence: 0.901603751818182

00:09:38.288 --> 00:09:39.623 is going to tell you.

NOTE Confidence: 0.901603751818182

00:09:39.630 --> 00:09:42.036 Who has autism and who doesn't?

NOTE Confidence: 0.901603751818182

00:09:42.040 --> 00:09:44.338 And that's a really tall order

NOTE Confidence: 0.901603751818182

00:09:44.338 --> 00:09:46.290 because autism isn't one thing

NOTE Confidence: 0.901603751818182

00:09:46.290 --> 00:09:48.342 right another way that you could

NOTE Confidence: 0.901603751818182

00:09:48.342 --> 00:09:50.370 think about a diagnostic biomarker.

NOTE Confidence: 0.901603751818182

00:09:50.370 --> 00:09:52.435 And the FDA includes this in their

NOTE Confidence: 0.901603751818182

00:09:52.435 --> 00:09:54.033 definition is as being diagnostic

NOTE Confidence: 0.901603751818182

00:09:54.033 --> 00:09:55.983 of a subtype of a condition.

NOTE Confidence: 0.901603751818182

00:09:55.990 --> 00:09:58.110 So if we think if we have this kind of

NOTE Confidence: 0.901603751818182

00:09:58.172 --> 00:10:00.682 picture from a paper that I like by evil off,

NOTE Confidence: 0.86905949375

00:10:00.690 --> 00:10:02.025 you could think about see

NOTE Confidence: 0.86905949375

00:10:02.025 --> 00:10:02.826 all the heterogeneity.

NOTE Confidence: 0.86905949375

00:10:02.830 --> 00:10:04.811 Well, what if you had a diagnostic

NOTE Confidence: 0.86905949375

00:10:04.811 --> 00:10:06.445 biomarker that told you something

NOTE Confidence: 0.86905949375

00:10:06.445 --> 00:10:08.460 about subtypes so that you're seeing?

NOTE Confidence: 0.86905949375

00:10:08.460 --> 00:10:09.581 OK, maybe these these.

NOTE Confidence: 0.86905949375

00:10:09.581 --> 00:10:11.840 People are going to have a different course.

NOTE Confidence: 0.86905949375

00:10:11.840 --> 00:10:13.898 Maybe some of these people are going

NOTE Confidence: 0.86905949375

00:10:13.898 --> 00:10:16.059 to respond in a different way to

NOTE Confidence: 0.86905949375

00:10:16.059 --> 00:10:17.889 a treatment and and that's really

NOTE Confidence: 0.86905949375

00:10:17.956 --> 00:10:19.720 this is the kind of biomarker.

NOTE Confidence: 0.86905949375

00:10:19.720 --> 00:10:21.480 That I am going to talk about today

NOTE Confidence: 0.86905949375

00:10:21.480 --> 00:10:23.233 and this is also I think a great

NOTE Confidence: 0.86905949375

00:10:23.233 --> 00:10:24.859 example when I say that I think

NOTE Confidence: 0.86905949375

00:10:24.859 --> 00:10:26.323 as clinicians we can do better.

NOTE Confidence: 0.86905949375

00:10:26.330 --> 00:10:28.850 So as a clinician as a field of

NOTE Confidence: 0.86905949375

00:10:28.850 --> 00:10:31.656 clinicians we had subtypes for autism right?

NOTE Confidence: 0.86905949375

00:10:31.660 --> 00:10:32.868 We had Asperger syndrome,

NOTE Confidence: 0.86905949375

00:10:32.868 --> 00:10:35.280 we had domino S, you know what?

NOTE Confidence: 0.86905949375

00:10:35.280 --> 00:10:38.598 They didn't work in 2013 with the DSM five.

NOTE Confidence: 0.86905949375

00:10:38.600 --> 00:10:40.944 We got rid of them because what was

NOTE Confidence: 0.86905949375

00:10:40.944 --> 00:10:42.475 more predictive of the diagnosis

NOTE Confidence: 0.86905949375

00:10:42.475 --> 00:10:44.239 you would get was the clinic,

NOTE Confidence: 0.86905949375

00:10:44.240 --> 00:10:45.815 the clinic that you were diagnosed at?

NOTE Confidence: 0.86905949375

00:10:45.820 --> 00:10:47.296 Then your characteristics right?

NOTE Confidence: 0.86905949375

00:10:47.296 --> 00:10:50.640 And so do I think there aren't subtypes.

NOTE Confidence: 0.86905949375

00:10:50.640 --> 00:10:52.038 No, I think there are subtypes,

NOTE Confidence: 0.86905949375

00:10:52.040 --> 00:10:53.360 but I think maybe the answer

NOTE Confidence: 0.86905949375

00:10:53.360 --> 00:10:54.240 is in the biology.

NOTE Confidence: 0.86905949375

00:10:54.240 --> 00:10:55.760 It's a place many, many,

NOTE Confidence: 0.86905949375

00:10:55.760 --> 00:10:58.231 many as two clinical eyes have failed

NOTE Confidence: 0.86905949375

00:10:58.231 --> 00:11:00.534 to find answers, so this is now.

NOTE Confidence: 0.86905949375

00:11:00.534 --> 00:11:02.400 This is not the FDA talking.

NOTE Confidence: 0.86905949375

00:11:02.400 --> 00:11:03.738 Now this is just me talking.

NOTE Confidence: 0.86905949375

00:11:03.740 --> 00:11:04.976 What are some of the things

NOTE Confidence: 0.86905949375

00:11:04.976 --> 00:11:05.800 that I think about?

NOTE Confidence: 0.86905949375

00:11:05.800 --> 00:11:07.697 What have I studied and interrogating some

NOTE Confidence: 0.86905949375

00:11:07.697 --> 00:11:09.779 of the biomarkers that I'll talk about today?

NOTE Confidence: 0.86905949375

00:11:09.780 --> 00:11:11.430 Well, I think a biomarker should

NOTE Confidence: 0.86905949375

00:11:11.430 --> 00:11:12.910 be sensitive to diagnostic status,

NOTE Confidence: 0.86905949375

00:11:12.910 --> 00:11:16.907 even if it's even if it's not.

NOTE Confidence: 0.86905949375

00:11:16.910 --> 00:11:19.625 Diagnostically, defining if it's not

NOTE Confidence: 0.86905949375

00:11:19.625 --> 00:11:22.340 hanging together with the diagnosis,

NOTE Confidence: 0.86905949375

00:11:22.340 --> 00:11:24.386 you know compared to typical development,

NOTE Confidence: 0.86905949375

00:11:24.390 --> 00:11:26.742 it may not be telling you something

NOTE Confidence: 0.86905949375

00:11:26.742 --> 00:11:28.420 meaningful about the condition.

NOTE Confidence: 0.86905949375

00:11:28.420 --> 00:11:30.226 You might want to biomarker to

NOTE Confidence: 0.86905949375

00:11:30.226 --> 00:11:31.430 be associated with symptoms,

NOTE Confidence: 0.86905949375

00:11:31.430 --> 00:11:33.022 so if we think not even in the

NOTE Confidence: 0.86905949375

00:11:33.022 --> 00:11:34.448 in the bins of diagnosis,

NOTE Confidence: 0.86905949375

00:11:34.450 --> 00:11:36.977 but if you think about in the

NOTE Confidence: 0.86905949375

00:11:36.977 --> 00:11:38.890 bins of functional processes,

NOTE Confidence: 0.86905949375

00:11:38.890 --> 00:11:39.179 right?

NOTE Confidence: 0.86905949375

00:11:39.179 --> 00:11:40.624 Maybe there should be biomarkers

NOTE Confidence: 0.86905949375

00:11:40.624 --> 00:11:42.445 that are coding for something about

NOTE Confidence: 0.86905949375

00:11:42.445 --> 00:11:44.269 eye contact and biomarkers that are

NOTE Confidence: 0.86905949375

00:11:44.269 --> 00:11:46.159 coding for something about language.

NOTE Confidence: 0.86905949375

00:11:46.160 --> 00:11:48.056 And you might expect each of those to

NOTE Confidence: 0.86905949375

00:11:48.056 --> 00:11:49.770 associate with symptoms in those domains,

NOTE Confidence: 0.86905949375

00:11:49.770 --> 00:11:51.994 but but in a way that may be

NOTE Confidence: 0.86905949375

00:11:51.994 --> 00:11:53.519 independent of the condition.

NOTE Confidence: 0.86905949375

00:11:53.520 --> 00:11:55.186 And then you'd also want to know

NOTE Confidence: 0.86905949375

00:11:55.186 --> 00:11:56.552 if we're thinking about biomarkers

NOTE Confidence: 0.86905949375

00:11:56.552 --> 00:11:57.756 in this more refined.

NOTE Confidence: 0.86905949375

00:11:57.760 --> 00:12:00.119 Kind of our doc way about tracking

NOTE Confidence: 0.86905949375

00:12:00.119 --> 00:12:01.750 on to specific domains.

NOTE Confidence: 0.86905949375

00:12:01.750 --> 00:12:04.342 You might also want to know whether the

NOTE Confidence: 0.86905949375

00:12:04.342 --> 00:12:06.130 associations you see are functionally

NOTE Confidence: 0.86905949375

00:12:06.130 --> 00:12:07.935 specific and it's an example.

NOTE Confidence: 0.86905949375

23

00:12:07.940 --> 00:12:10.868 If you had a biomarker that you thought

NOTE Confidence: 0.86905949375

00:12:10.868 --> 00:12:13.418 coded for something linguistic but

NOTE Confidence: 0.86905949375

00:12:13.418 --> 00:12:16.313 actually coded for cognitive ability,

NOTE Confidence: 0.86905949375

00:12:16.320 --> 00:12:17.804 you'd see strong correlations

NOTE Confidence: 0.86905949375

00:12:17.804 --> 00:12:19.659 between it and language right?

NOTE Confidence: 0.86905949375

00:12:19.660 --> 00:12:21.028 'cause cognitive ability is going to

NOTE Confidence: 0.86905949375

00:12:21.028 --> 00:12:22.350 stealing your language in some ways,

NOTE Confidence: 0.86905949375

00:12:22.350 --> 00:12:23.880 but if you had a treatment,

NOTE Confidence: 0.86905949375

00:12:23.880 --> 00:12:25.830 for example that you thought

NOTE Confidence: 0.86905949375

00:12:25.830 --> 00:12:27.780 might that did improve language.

NOTE Confidence: 0.86905949375

00:12:27.780 --> 00:12:29.742 It didn't improve cognitive ability you

NOTE Confidence: 0.86905949375

00:12:29.742 --> 00:12:31.768 your biomarker wouldn't track with it right?

NOTE Confidence: 0.86905949375

00:12:31.770 --> 00:12:34.242 So it's important to be thoughtful

NOTE Confidence: 0.86905949375

00:12:34.242 --> 00:12:35.890 about what they measure.

NOTE Confidence: 0.86905949375

00:12:35.890 --> 00:12:37.526 We want to understand.

NOTE Confidence: 0.86905949375

00:12:37.526 --> 00:12:39.980 How biomarkers are or are not

NOTE Confidence: 0.86905949375

00:12:40.060 --> 00:12:42.418 consistent across development.

NOTE Confidence: 0.96891057

00:12:42.420 --> 00:12:43.790 So when I say autism,

NOTE Confidence: 0.96891057

00:12:43.790 --> 00:12:44.798 you don't know who I'm talking about.

NOTE Confidence: 0.96891057

00:12:44.800 --> 00:12:46.492 A 3 year old, 30 year old or 60

NOTE Confidence: 0.96891057

00:12:46.492 --> 00:12:48.048 year old and if we just think

NOTE Confidence: 0.96891057

00:12:48.048 --> 00:12:49.609 about the way the brain works,

NOTE Confidence: 0.96891057

00:12:49.610 --> 00:12:50.609 it works differently.

NOTE Confidence: 0.96891057

00:12:50.609 --> 00:12:53.290 It looks differently at all of those ages,

NOTE Confidence: 0.96891057

00:12:53.290 --> 00:12:55.117 and so we have to be thoughtful about that.

NOTE Confidence: 0.96891057

00:12:55.120 --> 00:12:58.081 You might need different kinds of biomarkers

NOTE Confidence: 0.96891057

00:12:58.081 --> 00:13:00.410 at different points in development.

NOTE Confidence: 0.96891057

00:13:00.410 --> 00:13:02.300 We want to think about biomarkers and

NOTE Confidence: 0.96891057

00:13:02.300 --> 00:13:04.418 how they might be affected by behavior,

NOTE Confidence: 0.96891057

00:13:04.420 --> 00:13:06.136 or whether the robust to variations

NOTE Confidence: 0.96891057

00:13:06.136 --> 00:13:07.280 in behavior doesn't matter

NOTE Confidence: 0.96891057

00:13:07.335 --> 00:13:08.630 for every kind of biomarker.

NOTE Confidence: 0.96891057

00:13:08.630 --> 00:13:10.470 If it's a genetic biomarker,

NOTE Confidence: 0.96891057

00:13:10.470 --> 00:13:11.916 doesn't really matter what the child

NOTE Confidence: 0.96891057

00:13:11.916 --> 00:13:13.797 is doing during the blood draw the the

NOTE Confidence: 0.96891057

00:13:13.797 --> 00:13:15.524 information you get is going to be the

NOTE Confidence: 0.96891057

00:13:15.524 --> 00:13:17.479 same for the work that I'll talk about today.

NOTE Confidence: 0.96891057

00:13:17.479 --> 00:13:19.873 Like EG if a child is

NOTE Confidence: 0.96891057

00:13:19.873 --> 00:13:21.390 distressed during the EG.

NOTE Confidence: 0.96891057

00:13:21.390 --> 00:13:22.305 I'm not even measuring what

NOTE Confidence: 0.96891057

00:13:22.305 --> 00:13:23.037 I think I'm measuring.

NOTE Confidence: 0.96891057

00:13:23.040 --> 00:13:24.714 I'm just measuring the distress right

NOTE Confidence: 0.96891057

00:13:24.714 --> 00:13:27.285 and so we want to understand how a

NOTE Confidence: 0.96891057

00:13:27.285 --> 00:13:28.681 person's behavior during acquisition

NOTE Confidence: 0.96891057

00:13:28.681 --> 00:13:30.619 of these functional biomarkers.

NOTE Confidence: 0.96891057

00:13:30.620 --> 00:13:32.860 Could affect the biomarker measures.

NOTE Confidence: 0.96891057

00:13:32.860 --> 00:13:35.058 And then we want we might want

NOTE Confidence: 0.96891057

00:13:35.058 --> 00:13:36.485 biomarkers that are sensitive

NOTE Confidence: 0.96891057

00:13:36.485 --> 00:13:38.580 to changes in clinical status.

NOTE Confidence: 0.96891057

00:13:38.580 --> 00:13:39.906 So as a person gets better

NOTE Confidence: 0.96891057

00:13:39.906 --> 00:13:40.790 soon things go down.

NOTE Confidence: 0.96891057

00:13:40.790 --> 00:13:44.930 Maybe biomarker values become less extreme?

NOTE Confidence: 0.96891057

00:13:44.930 --> 00:13:46.295 I'm gonna highlight two things

NOTE Confidence: 0.96891057

00:13:46.295 --> 00:13:48.139 that I think are really tragically

NOTE Confidence: 0.96891057

00:13:48.139 --> 00:13:49.839 underappreciated in our fields.

NOTE Confidence: 0.96891057

00:13:49.840 --> 00:13:51.456 Biomarkers in autism are

NOTE Confidence: 0.96891057

00:13:51.456 --> 00:13:53.810 controversial for no good reason and,

NOTE Confidence: 0.96891057

00:13:53.810 --> 00:13:56.120 and I think the reason that they're

NOTE Confidence: 0.96891057

00:13:56.120 --> 00:13:57.659 controversial is 'cause people.

NOTE Confidence: 0.96891057

00:13:57.660 --> 00:13:59.388 Take a look at a biomarker,

NOTE Confidence: 0.96891057

00:13:59.390 --> 00:14:02.792 and think does it do all of these things?

NOTE Confidence: 0.96891057

00:14:02.800 --> 00:14:05.010 And a biomarker needn't do

NOTE Confidence: 0.96891057

00:14:05.010 --> 00:14:07.220 all of these things right?

NOTE Confidence: 0.96891057

00:14:07.220 --> 00:14:09.012 You don't need to do all of

NOTE Confidence: 0.96891057

00:14:09.012 --> 00:14:10.440 these things to be useful.

NOTE Confidence: 0.96891057

00:14:10.440 --> 00:14:12.904 You could do a subset of things to

NOTE Confidence: 0.96891057

00:14:12.904 --> 00:14:15.235 be useful and the subset that would

NOTE Confidence: 0.96891057

00:14:15.235 --> 00:14:17.720 be useful is going to vary depending

NOTE Confidence: 0.96891057

00:14:17.720 --> 00:14:20.030 on your context of use right?

NOTE Confidence: 0.96891057

00:14:20.030 --> 00:14:21.787 Which is another kind of FDA jargon

NOTE Confidence: 0.96891057

00:14:21.787 --> 00:14:23.344 for those biomarker categories, right?

NOTE Confidence: 0.96891057

00:14:23.344 --> 00:14:24.868 The purpose you use a biomarker

NOTE Confidence: 0.96891057

00:14:24.868 --> 00:14:26.611 and just give you 2 examples like

NOTE Confidence: 0.96891057

00:14:26.611 --> 00:14:27.776 if you had a biomarker.

NOTE Confidence: 0.96891057

00:14:27.780 --> 00:14:29.892 That you thought could be useful

NOTE Confidence: 0.96891057

00:14:29.892 --> 00:14:31.300 diagnostically for the condition

NOTE Confidence: 0.96891057

00:14:31.358 --> 00:14:32.278 or for a subtype.

NOTE Confidence: 0.96891057

00:14:32.280 --> 00:14:34.331 It might be really important for it

NOTE Confidence: 0.96891057

00:14:34.331 --> 00:14:36.478 to be sensitive to diagnostic status,

NOTE Confidence: 0.96891057

00:14:36.480 --> 00:14:39.408 to associate with symptoms.

NOTE Confidence: 0.96891057

00:14:39.408 --> 00:14:41.596 But you may not want it to be

NOTE Confidence: 0.96891057

00:14:41.596 --> 00:14:43.095 changed in clinic to be sensitive

NOTE Confidence: 0.96891057

00:14:43.095 --> 00:14:44.764 to change in clinical status, right?

NOTE Confidence: 0.96891057

00:14:44.764 --> 00:14:46.284 If it's defining the diagnostic

NOTE Confidence: 0.96891057

00:14:46.284 --> 00:14:48.090 condition and it's bouncing up and

NOTE Confidence: 0.96891057

00:14:48.090 --> 00:14:49.445 down every time someone responds

NOTE Confidence: 0.96891057

00:14:49.445 --> 00:14:49.987 to treatment,

NOTE Confidence: 0.96891057

00:14:49.990 --> 00:14:51.618 unless they're bouncing off

NOTE Confidence: 0.96891057

00:14:51.618 --> 00:14:52.839 the diagnostic spectrum,

NOTE Confidence: 0.96891057

00:14:52.840 --> 00:14:55.140 that would be a weakness, right?

NOTE Confidence: 0.96891057

00:14:55.140 --> 00:14:55.500 Conversely,

NOTE Confidence: 0.96891057

00:14:55.500 --> 00:14:58.020 if you had a biomarker that you

NOTE Confidence: 0.96891057

00:14:58.020 --> 00:14:59.962 wanted to evaluate for utility

NOTE Confidence: 0.96891057

00:14:59.962 --> 00:15:01.478 as a response biomarker,

NOTE Confidence: 0.96891057

00:15:01.480 --> 00:15:03.682 seeing if a person is responding

NOTE Confidence: 0.96891057

00:15:03.682 --> 00:15:04.416 to treatment.

NOTE Confidence: 0.96891057

00:15:04.420 --> 00:15:06.448 Sensitivity to change in clinical status

NOTE Confidence: 0.96891057

00:15:06.448 --> 00:15:09.241 would be the most and maybe the only

NOTE Confidence: 0.96891057

00:15:09.241 --> 00:15:11.305 really critical thing for the biomarker.

NOTE Confidence: 0.96891057

00:15:11.310 --> 00:15:13.417 So not only is it not necessary

NOTE Confidence: 0.96891057

00:15:13.417 --> 00:15:16.213 to look at biomarkers in this kind

NOTE Confidence: 0.96891057

00:15:16.213 --> 00:15:18.483 of scoping and comprehensive way,

NOTE Confidence: 0.96891057

00:15:18.490 --> 00:15:20.310 I think it's counterproductive and

NOTE Confidence: 0.96891057

00:15:20.310 --> 00:15:22.550 has impeded progress in our field.

NOTE Confidence: 0.96891057

00:15:22.550 --> 00:15:25.115 Today I also like to think

NOTE Confidence: 0.96891057

00:15:25.115 --> 00:15:26.150 keeping in mind what I

NOTE Confidence: 0.942322732105263

00:15:26.203 --> 00:15:27.339 said before about getting

NOTE Confidence: 0.942322732105263

00:15:27.339 --> 00:15:28.759 these things to the clinic.

NOTE Confidence: 0.942322732105263

00:15:28.760 --> 00:15:31.476 I like to think about practicalities like

NOTE Confidence: 0.942322732105263

00:15:31.476 --> 00:15:34.486 a biomarker for the field in which I work.

NOTE Confidence: 0.942322732105263

00:15:34.490 --> 00:15:36.016 Has to be viable in the people

NOTE Confidence: 0.942322732105263

00:15:36.016 --> 00:15:37.474 that I work with, right?

NOTE Confidence: 0.942322732105263

00:15:37.474 --> 00:15:41.346 It has to be something tolerable and safe.

NOTE Confidence: 0.942322732105263

00:15:41.350 --> 00:15:43.054 We want if for any biomarker

NOTE Confidence: 0.942322732105263

00:15:43.054 --> 00:15:44.650 to have use its scale,

NOTE Confidence: 0.942322732105263

00:15:44.650 --> 00:15:46.548 it has to be cost effective, right?

NOTE Confidence: 0.942322732105263

00:15:46.548 --> 00:15:48.494 If it's if it's being implemented at

NOTE Confidence: 0.942322732105263

00:15:48.494 --> 00:15:50.840 scale and then we would also need it to

NOTE Confidence: 0.942322732105263

00:15:50.840 --> 00:15:52.897 be accessible and just as an illustration,

NOTE Confidence: 0.942322732105263

00:15:52.900 --> 00:15:55.924 if you had a biomarker that could only be

NOTE Confidence: 0.942322732105263

00:15:55.924 --> 00:15:58.526 quantified at an autism center of excellence,

NOTE Confidence: 0.942322732105263

00:15:58.530 --> 00:15:59.700 this would be its reach.

NOTE Confidence: 0.942322732105263

00:15:59.700 --> 00:16:02.130 And if you had a biomarker that could be

NOTE Confidence: 0.942322732105263

00:16:02.130 --> 00:16:04.167 quantified at any hospital, this would be.

NOTE Confidence: 0.942322732105263

00:16:04.170 --> 00:16:04.788 It's reached right?

NOTE Confidence: 0.942322732105263

00:16:04.788 --> 00:16:06.024 And this is what we want.

NOTE Confidence: 0.942322732105263

00:16:06.030 --> 00:16:08.614 We want to be able to make these

NOTE Confidence: 0.942322732105263

00:16:08.614 --> 00:16:10.109 things accessible to everyone.

NOTE Confidence: 0.942322732105263

00:16:10.110 --> 00:16:12.840 I do a lot of work Mike mentioned in EG

NOTE Confidence: 0.942322732105263

00:16:12.910 --> 00:16:15.850 and EG is stands for electroencephalogram.

NOTE Confidence: 0.942322732105263

00:16:15.850 --> 00:16:17.956 It's a method of measuring brain

NOTE Confidence: 0.942322732105263

00:16:17.956 --> 00:16:20.285 activity in which you record electrical

NOTE Confidence: 0.942322732105263

00:16:20.285 --> 00:16:22.865 activity from neurons at the scalp.

NOTE Confidence: 0.942322732105263

00:16:22.870 --> 00:16:25.411 So using a net like you see

NOTE Confidence: 0.942322732105263

00:16:25.411 --> 00:16:27.320 here in this picture.

NOTE Confidence: 0.942322732105263

00:16:27.320 --> 00:16:30.170 You can do it in two different kinds of ways.

NOTE Confidence: 0.942322732105263

00:16:30.170 --> 00:16:30.507 Really,

NOTE Confidence: 0.942322732105263

00:16:30.507 --> 00:16:32.866 you could measure someone's activity at rest,

NOTE Confidence: 0.942322732105263

00:16:32.870 --> 00:16:35.276 or you could make discrete things

NOTE Confidence: 0.942322732105263

00:16:35.276 --> 00:16:37.690 happen in the environment and record

NOTE Confidence: 0.942322732105263

00:16:37.690 --> 00:16:39.892 a person's brain response to those

NOTE Confidence: 0.942322732105263

00:16:39.892 --> 00:16:42.198 to those events as they happen.

NOTE Confidence: 0.942322732105263

00:16:42.200 --> 00:16:43.520 That latter thing is called

NOTE Confidence: 0.942322732105263

00:16:43.520 --> 00:16:44.576 an event related potential,

NOTE Confidence: 0.942322732105263

00:16:44.580 --> 00:16:47.420 and I'll talk a lot about that today.

NOTE Confidence: 0.942322732105263

00:16:47.420 --> 00:16:48.160 The way we do it,

NOTE Confidence: 0.942322732105263

00:16:48.160 --> 00:16:49.630 let me just tell you really quickly

NOTE Confidence: 0.942322732105263

00:16:49.630 --> 00:16:50.938 that little inset picture you see,

NOTE Confidence: 0.942322732105263

00:16:50.940 --> 00:16:52.950 that's what a natural ERP netizen

NOTE Confidence: 0.942322732105263

00:16:52.950 --> 00:16:54.656 it's it's soft rubber pedestals

NOTE Confidence: 0.942322732105263

00:16:54.656 --> 00:16:56.176 with a sponge in it.

NOTE Confidence: 0.942322732105263

00:16:56.180 --> 00:16:58.754 We soak the whole thing in salt water and

NOTE Confidence: 0.942322732105263

00:16:58.754 --> 00:17:01.280 then we stretch it over a person's head.

NOTE Confidence: 0.942322732105263

00:17:01.280 --> 00:17:02.260 Those those,

NOTE Confidence: 0.942322732105263

00:17:02.260 --> 00:17:04.710 those now saltwater moistened sponges

NOTE Confidence: 0.942322732105263

00:17:04.710 --> 00:17:06.180 become electrically conductive

NOTE Confidence: 0.942322732105263

00:17:06.245 --> 00:17:08.191 and they pick up the activity so

NOTE Confidence: 0.942322732105263

00:17:08.191 --> 00:17:10.059 you know it's not comfortable.

NOTE Confidence: 0.942322732105263

00:17:10.060 --> 00:17:12.308 It's not fun to wear EG net but

NOTE Confidence: 0.942322732105263

00:17:12.308 --> 00:17:14.745 compared to other forms of measuring

NOTE Confidence: 0.942322732105263

00:17:14.745 --> 00:17:17.000 brain activity it's pretty tolerable.

NOTE Confidence: 0.942322732105263

00:17:17.000 --> 00:17:17.885 Pretty user friendly.

NOTE Confidence: 0.942322732105263

00:17:17.885 --> 00:17:19.950 And that also makes it a really

NOTE Confidence: 0.942322732105263

00:17:20.015 --> 00:17:21.019 viable technology.

NOTE Confidence: 0.942322732105263

00:17:21.020 --> 00:17:23.533 You know, across a wide range of

NOTE Confidence: 0.942322732105263

00:17:23.533 --> 00:17:25.090 cognitive and developmental levels.

NOTE Confidence: 0.942322732105263

00:17:25.090 --> 00:17:25.523 Noninvasive,

NOTE Confidence: 0.942322732105263

00:17:25.523 --> 00:17:27.688 pretty movement tolerant if a

NOTE Confidence: 0.942322732105263

00:17:27.688 --> 00:17:28.987 person moves around,

NOTE Confidence: 0.942322732105263

00:17:28.990 --> 00:17:30.726 you're going to lose data from those trials,

NOTE Confidence: 0.942322732105263

00:17:30.730 --> 00:17:32.338 but it's not going to ruin

NOTE Confidence: 0.942322732105263

00:17:32.338 --> 00:17:33.410 an entire recording session.

NOTE Confidence: 0.942322732105263

00:17:33.410 --> 00:17:35.110 And it's also really practical.

NOTE Confidence: 0.942322732105263

00:17:35.110 --> 00:17:36.350 So EG, is cheap.

NOTE Confidence: 0.942322732105263

00:17:36.350 --> 00:17:38.850 It's expensive to get in EG machine,

NOTE Confidence: 0.942322732105263

00:17:38.850 --> 00:17:39.850 but when you have one,

NOTE Confidence: 0.942322732105263

00:17:39.850 --> 00:17:41.906 all it costs a saltwater and latex gloves

NOTE Confidence: 0.942322732105263

00:17:41.906 --> 00:17:43.709 to collect data and it's accessible.

NOTE Confidence: 0.942322732105263

00:17:43.710 --> 00:17:45.372 There's an EEG system in every

NOTE Confidence: 0.942322732105263

00:17:45.372 --> 00:17:46.480 hospital in this country.

NOTE Confidence: 0.942322732105263

00:17:46.480 --> 00:17:48.628 Eegs already used the population level.

NOTE Confidence: 0.942322732105263

00:17:48.630 --> 00:17:49.454 For screening,

NOTE Confidence: 0.942322732105263

00:17:49.454 --> 00:17:50.690 for hearing difficulties

NOTE Confidence: 0.942322732105263

00:17:50.690 --> 00:17:51.926 in newborn procedures.

NOTE Confidence: 0.942322732105263

00:17:51.930 --> 00:17:53.685 So if there were something

NOTE Confidence: 0.942322732105263

00:17:53.685 --> 00:17:55.089 that was scientifically worthy,

NOTE Confidence: 0.942322732105263

00:17:55.090 --> 00:17:57.095 biomarker wise is a technology

NOTE Confidence: 0.942322732105263

00:17:57.095 --> 00:17:58.699 that could be useful.

NOTE Confidence: 0.942322732105263

00:17:58.700 --> 00:17:59.720 And then lastly,

NOTE Confidence: 0.942322732105263

00:17:59.720 --> 00:18:01.760 I've mentioned that I think social

NOTE Confidence: 0.942322732105263

00:18:01.760 --> 00:18:03.140 communication is central to

NOTE Confidence: 0.942322732105263

00:18:03.140 --> 00:18:04.775 understanding the biology of autism.

NOTE Confidence: 0.942322732105263

00:18:04.780 --> 00:18:05.108 Well,

NOTE Confidence: 0.942322732105263

00:18:05.108 --> 00:18:07.404 ERP is a technology and a field

NOTE Confidence: 0.942322732105263

00:18:07.404 --> 00:18:09.841 that's really been useful in

NOTE Confidence: 0.942322732105263

00:18:09.841 --> 00:18:12.129 understanding social communication and

NOTE Confidence: 0.942322732105263

00:18:12.129 --> 00:18:13.845 typical developmental neuroscience.

NOTE Confidence: 0.88469954875

00:18:13.850 --> 00:18:16.818 So this is an example of an ERP.

NOTE Confidence: 0.8159892

00:18:23.260 --> 00:18:24.496 This is when ERP looks like.

NOTE Confidence: 0.8159892

00:18:24.500 --> 00:18:26.444 So when you when you see any RP,

NOTE Confidence: 0.8159892

00:18:26.450 --> 00:18:27.980 you're looking on the Y axis,

NOTE Confidence: 0.8159892

00:18:27.980 --> 00:18:29.100 you're seeing voltage so kind

36

NOTE Confidence: 0.8159892

00:18:29.100 --> 00:18:30.507 of strength of signal and that

NOTE Confidence: 0.8159892

00:18:30.507 --> 00:18:31.697 could be positive or negative,

NOTE Confidence: 0.8159892

00:18:31.700 --> 00:18:32.832 and there's nothing intrinsically

NOTE Confidence: 0.8159892

00:18:32.832 --> 00:18:34.791 meaningful by the positive ITI or the

NOTE Confidence: 0.8159892

00:18:34.791 --> 00:18:36.543 negativity and then on the X axis you're

NOTE Confidence: 0.8159892

00:18:36.543 --> 00:18:38.052 looking at the timing and so these

NOTE Confidence: 0.8159892

00:18:38.052 --> 00:18:39.596 are things that happen really fast,

NOTE Confidence: 0.8159892

00:18:39.596 --> 00:18:41.744 so this timing is in milliseconds

NOTE Confidence: 0.8159892

00:18:41.744 --> 00:18:44.218 and what you see highlighted there

NOTE Confidence: 0.8159892

00:18:44.218 --> 00:18:46.333 in purple isn't event related

NOTE Confidence: 0.8159892

00:18:46.333 --> 00:18:47.930 potential in ERP component.

NOTE Confidence: 0.8159892

00:18:47.930 --> 00:18:49.354 Called an N 170,

NOTE Confidence: 0.8159892

00:18:49.354 --> 00:18:52.054 meaning that it happens at around 170

NOTE Confidence: 0.8159892

00:18:52.054 --> 00:18:54.489 milliseconds and it's negative going.

NOTE Confidence: 0.8159892

00:18:54.490 --> 00:18:57.350 What it represents very well.

NOTE Confidence: 0.8159892

00:18:57.350 --> 00:18:58.637 Studying typical developed.

NOTE Confidence: 0.8159892

00:18:58.637 --> 00:19:01.640 The first study actually being done here

NOTE Confidence: 0.8159892

00:19:01.703 --> 00:19:03.775 at Yale by Greg McCarthyism event and

NOTE Confidence: 0.8159892

00:19:03.775 --> 00:19:06.940 it is the brain acknowledging a face as such.

NOTE Confidence: 0.8159892

00:19:06.940 --> 00:19:08.510 So not happy, not sad.

NOTE Confidence: 0.8159892

00:19:08.510 --> 00:19:10.178 Not mom, not neighbor.

NOTE Confidence: 0.8159892

00:19:10.178 --> 00:19:12.263 Just this is a face.

NOTE Confidence: 0.8159892

00:19:12.270 --> 00:19:14.742 And it's what's remarkable about it

NOTE Confidence: 0.8159892

00:19:14.742 --> 00:19:18.490 is that within 2/10 of a second,

NOTE Confidence: 0.8159892

00:19:18.490 --> 00:19:20.812 our brains are treating faces really

NOTE Confidence: 0.8159892

00:19:20.812 --> 00:19:22.785 qualitatively different from just about

NOTE Confidence: 0.8159892

00:19:22.785 --> 00:19:24.625 everything else that comes online.

NOTE Confidence: 0.8159892

00:19:24.630 --> 00:19:25.695 Early in development.

NOTE Confidence: 0.8159892

00:19:25.695 --> 00:19:28.661 We think it is critically important for our

NOTE Confidence: 0.8159892

00:19:28.661 --> 00:19:30.746 ability to perceive social information.

NOTE Confidence: 0.8159892

00:19:30.750 --> 00:19:32.286 One of the first studies I did as

NOTE Confidence: 0.8159892

00:19:32.286 --> 00:19:33.589 a graduate student is actually,

NOTE Confidence: 0.8159892

00:19:33.590 --> 00:19:34.030 you know,

NOTE Confidence: 0.8159892

00:19:34.030 --> 00:19:35.570 to to parallel my arc of the

NOTE Confidence: 0.8159892

00:19:35.570 --> 00:19:36.886 Child Study Center was published

NOTE Confidence: 0.8159892

00:19:36.886 --> 00:19:39.073 my first year here was to try to

NOTE Confidence: 0.8159892

00:19:39.073 --> 00:19:40.498 understand how this might look

NOTE Confidence: 0.8159892

00:19:40.498 --> 00:19:41.976 different in people with autism.

NOTE Confidence: 0.8159892

00:19:41.976 --> 00:19:44.777 And what we found way back when in two

NOTE Confidence: 0.8159892

00:19:44.777 --> 00:19:47.420 four 2004 is that there was a difference.

NOTE Confidence: 0.8159892

00:19:47.420 --> 00:19:49.527 And it was that the brains of

NOTE Confidence: 0.8159892

00:19:49.527 --> 00:19:51.175 people with autism took longer

NOTE Confidence: 0.8159892

00:19:51.175 --> 00:19:52.875 to respond to these faces.

NOTE Confidence: 0.8159892

00:19:52.880 --> 00:19:55.728 We we would say it has a longer

NOTE Confidence: 0.8159892

00:19:55.728 --> 00:19:57.548 latency of their N 170.

NOTE Confidence: 0.8159892

00:19:57.550 --> 00:19:59.550 And as I talk about a series of

NOTE Confidence: 0.8159892

00:19:59.550 --> 00:20:01.368 studies over these next few slides,

NOTE Confidence: 0.8159892

00:20:01.370 --> 00:20:02.987 I'm gonna tie them back to some

NOTE Confidence: 0.8159892

00:20:02.987 --> 00:20:04.352 of those things that I said

NOTE Confidence: 0.8159892

00:20:04.352 --> 00:20:05.794 that I think about in terms of

NOTE Confidence: 0.8159892

00:20:05.852 --> 00:20:07.280 biomarker performance and so,

NOTE Confidence: 0.8159892

00:20:07.280 --> 00:20:10.196 so this gives us some evidence that we see.

NOTE Confidence: 0.8159892

00:20:10.200 --> 00:20:12.588 We see it hanging together with

NOTE Confidence: 0.8159892

00:20:12.588 --> 00:20:14.458 diagnostic status, not diagnostically.

NOTE Confidence: 0.8159892

00:20:14.458 --> 00:20:15.526 Defining right.

NOTE Confidence: 0.8159892

00:20:15.526 --> 00:20:17.402 These are distributions, right?

NOTE Confidence: 0.8159892

00:20:17.402 --> 00:20:19.850 So if you looked at its two bell curves

NOTE Confidence: 0.8159892

00:20:19.919 --> 00:20:22.030 that overlap, and the people with autism,

NOTE Confidence: 0.8159892

00:20:22.030 --> 00:20:24.016 or shifted, but there's a difference.

NOTE Confidence: 0.8159892

00:20:24.020 --> 00:20:24.732 On average.

NOTE Confidence: 0.8159892

00:20:24.732 --> 00:20:27.224 We also saw again in this study.

NOTE Confidence: 0.8159892

00:20:27.230 --> 00:20:28.960 This is adolescents and adults.

NOTE Confidence: 0.8159892

00:20:28.960 --> 00:20:31.642 That people with autism had more

NOTE Confidence: 0.8159892

00:20:31.642 --> 00:20:33.902 trouble actually recognizing faces and

NOTE Confidence: 0.8159892

00:20:33.902 --> 00:20:36.302 their ability to recognize faces was

NOTE Confidence: 0.8159892

00:20:36.302 --> 00:20:38.977 associated with how fast their N 170 was.

NOTE Confidence: 0.8159892

00:20:38.980 --> 00:20:40.160 So again, then we thought,

NOTE Confidence: 0.8159892

00:20:40.160 --> 00:20:40.518 OK,

NOTE Confidence: 0.8159892

00:20:40.518 --> 00:20:40.876 look,

NOTE Confidence: 0.8159892

00:20:40.876 --> 00:20:43.024 this is also something that hangs

NOTE Confidence: 0.8159892

00:20:43.024 --> 00:20:44.193 together with symptomatology

NOTE Confidence: 0.8159892

00:20:44.193 --> 00:20:46.509 or social function in a way.

NOTE Confidence: 0.8159892

00:20:46.510 --> 00:20:48.750 So we.

NOTE Confidence: 0.8159892

00:20:48.750 --> 00:20:48.954 Paul,

NOTE Confidence: 0.8159892

00:20:48.954 --> 00:20:50.586 this is this is this is your last

NOTE Confidence: 0.8159892

00:20:50.586 --> 00:20:52.316 free question before the Q&A session.

NOTE Confidence: 0.91052985

00:20:55.170 --> 00:20:55.390 This.

NOTE Confidence: 0.75279255

00:21:00.560 --> 00:21:02.336 Restate the question. The question is,

NOTE Confidence: 0.75279255

00:21:02.340 --> 00:21:04.068 is it specific to our autism?

NOTE Confidence: 0.75279255

00:21:04.070 --> 00:21:06.278 Is there common in many different

NOTE Confidence: 0.75279255

00:21:06.278 --> 00:21:07.750 disorders and the answer

NOTE Confidence: 0.75279255

00:21:07.816 --> 00:21:09.526 is both and thank you Paul.

NOTE Confidence: 0.75279255

00:21:09.530 --> 00:21:10.810 I for all you're wondering.

NOTE Confidence: 0.75279255

00:21:10.810 --> 00:21:13.330 He's not a plant.

NOTE Confidence: 0.75279255

00:21:13.330 --> 00:21:14.710 But he did perfectly illustrate

NOTE Confidence: 0.75279255

00:21:14.710 --> 00:21:16.831 is why you just wait until the

NOTE Confidence: 0.75279255

00:21:16.831 --> 00:21:18.531 question and answer session because

NOTE Confidence: 0.75279255

00:21:18.531 --> 00:21:20.479 your questions may be answered in

NOTE Confidence: 0.75279255

00:21:20.479 --> 00:21:22.213 the course of the existing slides.

NOTE Confidence: 0.9341575

00:21:25.290 --> 00:21:25.770 So.

NOTE Confidence: 0.839417662222222

00:21:29.500 --> 00:21:32.992 OK, so the so so so then we wondered.

NOTE Confidence: 0.839417662222222

00:21:33.000 --> 00:21:34.638 OK, well what so we're seeing it

NOTE Confidence: 0.839417662222222

00:21:34.638 --> 00:21:36.641 slower to face is well is that

00:21:36.641 --> 00:21:38.206 telling us something about social

00:21:38.206 --> 00:21:39.720 communication which is what we think?

00:21:39.720 --> 00:21:41.340 Or could this be telling us

00:21:41.340 --> 00:21:43.224 something about the pace of a brain

00:21:43.224 --> 00:21:44.712 in autism which could be useful,

00:21:44.720 --> 00:21:46.164 but is something different.

00:21:46.164 --> 00:21:48.330 So we wanted are the differences,

00:21:48.330 --> 00:21:49.641 particularly social information.

00:21:49.641 --> 00:21:51.389 Might they reflected general

00:21:51.389 --> 00:21:52.263 perceptual slowing?

00:21:52.270 --> 00:21:54.646 How could we test that we could

00:21:54.646 --> 00:21:56.238 find something that works

00:21:56.238 --> 00:21:58.420 well in people with autism?

00:21:58.420 --> 00:22:01.020 And see their N 170 works well and we did.

00:22:01.020 --> 00:22:03.060 We looked at reading because it turns out

00:22:03.060 --> 00:22:05.078 that when you learn to read a language,

NOTE Confidence: 0.839417662222222

00:22:05.080 --> 00:22:07.426 any language you start to get

NOTE Confidence: 0.839417662222222

00:22:07.426 --> 00:22:10.120 an end 170 left lateralized,

NOTE Confidence: 0.839417662222222

00:22:10.120 --> 00:22:12.170 unlike right lateralized face face,

NOTE Confidence: 0.839417662222222

00:22:12.170 --> 00:22:14.660 and 172 letters that alphabet.

NOTE Confidence: 0.839417662222222

00:22:14.660 --> 00:22:15.997 And so we did the kind of

NOTE Confidence: 0.839417662222222

00:22:15.997 --> 00:22:17.100 experiment that we've done before.

NOTE Confidence: 0.839417662222222

00:22:17.100 --> 00:22:18.232 You know comparing faces

NOTE Confidence: 0.839417662222222

00:22:18.232 --> 00:22:19.364 with something non social,

NOTE Confidence: 0.839417662222222

00:22:19.370 --> 00:22:21.926 but then we compared letters highlighted

NOTE Confidence: 0.839417662222222

00:22:21.926 --> 00:22:24.275 there in purple with pseudo letters.

NOTE Confidence: 0.839417662222222

00:22:24.275 --> 00:22:26.405 So I made up Alphabet and

NOTE Confidence: 0.839417662222222

00:22:26.405 --> 00:22:28.616 the idea being OK if this is.

NOTE Confidence: 0.839417662222222

00:22:28.620 --> 00:22:29.980 Telling us something unique

NOTE Confidence: 0.839417662222222

00:22:29.980 --> 00:22:31.000 about social processing,

NOTE Confidence: 0.839417662222222

00:22:31.000 --> 00:22:32.080 we should see differences

00:22:32.080 --> 00:22:33.160 in people with autism.

00:22:33.160 --> 00:22:34.750 We do this social experiment,

00:22:34.750 --> 00:22:36.530 but they should look just

00:22:36.530 --> 00:22:37.598 like everybody else.

00:22:37.600 --> 00:22:39.118 We do the non social experiment.

00:22:39.120 --> 00:22:41.580 Or conversely if it's generic problem.

00:22:41.580 --> 00:22:43.232 We should see differences

00:22:43.232 --> 00:22:44.058 everywhere everywhere.

00:22:44.060 --> 00:22:46.346 We also use this as a chance to look

00:22:46.346 --> 00:22:48.522 at how this phenomenon manifests in

00:22:48.522 --> 00:22:51.230 a younger cohort of kids with autism.

00:22:51.230 --> 00:22:53.624 So these were grade school kids and

00:22:53.624 --> 00:22:56.056 when we looked at the faces we saw

00:22:56.056 --> 00:22:58.690 the things that we had seen before.

00:22:58.690 --> 00:23:01.306 We saw that they were worse at face

00:23:01.306 --> 00:23:03.263 recognition and we saw that their

NOTE Confidence: 0.839417662222222

00:23:03.263 --> 00:23:05.630 face processing or and 170 was slower,

NOTE Confidence: 0.839417662222222

00:23:05.630 --> 00:23:07.590 so this was cool because it's also

NOTE Confidence: 0.839417662222222

00:23:07.590 --> 00:23:09.212 telling us look this phenomenon

NOTE Confidence: 0.839417662222222

00:23:09.212 --> 00:23:11.366 that we've seen in adolescents and

NOTE Confidence: 0.839417662222222

00:23:11.366 --> 00:23:13.099 adults seemed to be consistent.

NOTE Confidence: 0.839417662222222

00:23:13.100 --> 00:23:13.916 You know,

NOTE Confidence: 0.839417662222222

00:23:13.916 --> 00:23:16.364 across a broader span of development.

NOTE Confidence: 0.839417662222222

00:23:16.370 --> 00:23:19.592 When we looked at the the non social things,

NOTE Confidence: 0.839417662222222

00:23:19.600 --> 00:23:21.466 we had a very different picture.

NOTE Confidence: 0.839417662222222

00:23:21.470 --> 00:23:23.950 We saw that the kids with autism they

NOTE Confidence: 0.839417662222222

00:23:23.950 --> 00:23:26.314 did word reading and decoding on

NOTE Confidence: 0.839417662222222

00:23:26.314 --> 00:23:28.404 par with their typical counterparts

NOTE Confidence: 0.839417662222222

00:23:28.404 --> 00:23:30.801 as we would expect based on their

NOTE Confidence: 0.839417662222222

00:23:30.801 --> 00:23:33.759 IQ and then we also saw that their

NOTE Confidence: 0.839417662222222

00:23:33.759 --> 00:23:35.320 brain activity wasn't slow.

NOTE Confidence: 0.839417662222222

00:23:35.320 --> 00:23:36.881 They responded to the to the letters

NOTE Confidence: 0.839417662222222

00:23:36.881 --> 00:23:38.220 the way we would expect.

NOTE Confidence: 0.839417662222222

00:23:38.220 --> 00:23:39.400 Which is really, you know,

NOTE Confidence: 0.839417662222222

00:23:39.400 --> 00:23:41.856 if you look at this this lower chart

NOTE Confidence: 0.839417662222222

00:23:41.856 --> 00:23:44.678 you see the purple is the purple is

NOTE Confidence: 0.839417662222222

00:23:44.678 --> 00:23:47.080 their brain response to an amplitude.

NOTE Confidence: 0.839417662222222

00:23:47.080 --> 00:23:47.797 To the letters,

NOTE Confidence: 0.839417662222222

00:23:47.797 --> 00:23:49.470 the green to the pseudo letters and

NOTE Confidence: 0.839417662222222

00:23:49.521 --> 00:23:51.257 you can see everybody is showing a

NOTE Confidence: 0.839417662222222

00:23:51.257 --> 00:23:53.018 bigger response to letters showing

NOTE Confidence: 0.839417662222222

00:23:53.018 --> 00:23:53.980 effective specialization.

NOTE Confidence: 0.839417662222222

00:23:53.980 --> 00:23:55.250 Latency is not shown there,

NOTE Confidence: 0.839417662222222

00:23:55.250 --> 00:23:56.978 but we didn't see differences in

NOTE Confidence: 0.839417662222222

00:23:56.978 --> 00:23:58.820 latency and the people with autism,

NOTE Confidence: 0.839417662222222

00:23:58.820 --> 00:24:00.808 and so this was kind of interesting

NOTE Confidence: 0.839417662222222

00:24:00.808 --> 00:24:02.524 in that it's suggesting the

NOTE Confidence: 0.839417662222222

00:24:02.524 --> 00:24:04.534 differences that we're seeing that

NOTE Confidence: 0.839417662222222

00:24:04.534 --> 00:24:06.748 people with autism are slower that.

NOTE Confidence: 0.839417662222222

00:24:06.750 --> 00:24:09.020 This slowness corresponds to face

NOTE Confidence: 0.839417662222222

00:24:09.020 --> 00:24:11.290 recognition abilities is not just

NOTE Confidence: 0.839417662222222

00:24:11.361 --> 00:24:13.256 telling us they're not slow.

NOTE Confidence: 0.839417662222222

00:24:13.260 --> 00:24:14.631 For everything else,

NOTE Confidence: 0.839417662222222

00:24:14.631 --> 00:24:16.459 they're fine for letters.

NOTE Confidence: 0.932834187857143

00:24:16.460 --> 00:24:18.708 So the next study that we did and

NOTE Confidence: 0.932834187857143

00:24:18.708 --> 00:24:20.965 when I'm also going to do again,

NOTE Confidence: 0.932834187857143

00:24:20.965 --> 00:24:23.395 kind of a referencing my life

NOTE Confidence: 0.932834187857143

00:24:23.395 --> 00:24:25.250 of the Child Study Center when I

NOTE Confidence: 0.932834187857143

00:24:25.300 --> 00:24:26.878 can tell my first grand rounds,

NOTE Confidence: 0.932834187857143

00:24:26.880 --> 00:24:28.280 I was still a trainee and so today

NOTE Confidence: 0.932834187857143

00:24:28.280 --> 00:24:30.075 as I go through some of these talks,

NOTE Confidence: 0.932834187857143

00:24:30.080 --> 00:24:31.823 I'm going to highlight some of the

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NOTE Confidence: 0.932834187857143

00:24:31.823 --> 00:24:33.138 trainees who've been central to

NOTE Confidence: 0.932834187857143

00:24:33.138 --> 00:24:34.937 realizing the papers that have come out.

NOTE Confidence: 0.932834187857143

00:24:34.940 --> 00:24:35.640 And so there, you see?

NOTE Confidence: 0.932834187857143

00:24:35.640 --> 00:24:36.414 Tamara Parker,

NOTE Confidence: 0.932834187857143

00:24:36.414 --> 00:24:39.123 who's a student in the PhD student

NOTE Confidence: 0.932834187857143

00:24:39.123 --> 00:24:41.040 Rental Neuroscience program?

NOTE Confidence: 0.932834187857143

00:24:41.040 --> 00:24:44.330 And So what we did in this study was wonder

NOTE Confidence: 0.932834187857143

00:24:44.415 --> 00:24:47.789 about how behavior during a biomarker assay.

NOTE Confidence: 0.932834187857143

00:24:47.790 --> 00:24:50.002 Might affect the biomarker values and let

NOTE Confidence: 0.932834187857143

00:24:50.002 --> 00:24:52.687 me tell you why it's important for this.

NOTE Confidence: 0.932834187857143

00:24:52.690 --> 00:24:55.010 So any 170 latency relates

NOTE Confidence: 0.932834187857143

00:24:55.010 --> 00:24:58.160 to how you look at a face.

NOTE Confidence: 0.932834187857143

00:24:58.160 --> 00:25:01.538 Eyes make your end 170 faster.

NOTE Confidence: 0.932834187857143

00:25:01.540 --> 00:25:03.562 I've just told you that people

NOTE Confidence: 0.932834187857143

00:25:03.562 --> 00:25:06.018 with autism have a slower and 170.

NOTE Confidence: 0.932834187857143

00:25:06.020 --> 00:25:07.685 Many if for those of you who've been in

NOTE Confidence: 0.932834187857143

00:25:07.685 --> 00:25:09.530 this room, you know two decades ago,

NOTE Confidence: 0.932834187857143

00:25:09.530 --> 00:25:11.138 you'd hear lots of people telling you people,

NOTE Confidence: 0.932834187857143

00:25:11.140 --> 00:25:13.564 autism don't look so much to the eyes.

NOTE Confidence: 0.932834187857143

00:25:13.570 --> 00:25:15.834 So what if when we do an experiment,

NOTE Confidence: 0.932834187857143

00:25:15.840 --> 00:25:17.534 people with autism and just looking at

NOTE Confidence: 0.932834187857143

00:25:17.534 --> 00:25:19.410 the faces on the screen differently?

NOTE Confidence: 0.932834187857143

00:25:19.410 --> 00:25:21.984 And I'm just doing an unnecessarily

NOTE Confidence: 0.932834187857143

00:25:21.984 --> 00:25:23.700 complicated eye tracking experiment,

NOTE Confidence: 0.932834187857143

00:25:23.700 --> 00:25:24.150 right?

NOTE Confidence: 0.932834187857143

00:25:24.150 --> 00:25:27.246 So what we could do is we could

NOTE Confidence: 0.932834187857143

00:25:27.246 --> 00:25:29.220 control the way people look at faces.

NOTE Confidence: 0.932834187857143

00:25:29.220 --> 00:25:31.920 We could have crosshairs that ensure

NOTE Confidence: 0.932834187857143

00:25:31.920 --> 00:25:33.900 that a person is looking to the eyes or

NOTE Confidence: 0.932834187857143

00:25:33.957 --> 00:25:36.063 looking to the nose and looking to them out.

NOTE Confidence: 0.932834187857143

00:25:36.070 --> 00:25:37.408 And what we want to understand

NOTE Confidence: 0.932834187857143

00:25:37.408 --> 00:25:39.072 is what if when we make people

NOTE Confidence: 0.932834187857143

00:25:39.072 --> 00:25:40.500 with autism look to the eyes?

NOTE Confidence: 0.932834187857143

00:25:40.500 --> 00:25:42.375 These differences in brain activity

NOTE Confidence: 0.932834187857143

00:25:42.375 --> 00:25:44.862 that we seek go away and we

NOTE Confidence: 0.932834187857143

00:25:44.862 --> 00:25:46.698 stop putting EG Nets on peoples

NOTE Confidence: 0.932834187857143

00:25:46.698 --> 00:25:48.587 heads and we just do I track.

NOTE Confidence: 0.932834187857143

00:25:48.590 --> 00:25:50.000 It's not what we saw.

NOTE Confidence: 0.932834187857143

00:25:50.000 --> 00:25:51.806 We saw that what you would expect.

NOTE Confidence: 0.932834187857143

00:25:51.810 --> 00:25:53.500 I'll explain this this figure.

NOTE Confidence: 0.932834187857143

00:25:53.500 --> 00:25:55.060 It's a little bit complicated

NOTE Confidence: 0.932834187857143

00:25:55.060 --> 00:25:57.010 so you can see here eyes.

NOTE Confidence: 0.932834187857143

00:25:57.010 --> 00:25:59.418 You can see the nose see the mount.

NOTE Confidence: 0.932834187857143

00:25:59.420 --> 00:26:02.212 This is where people are looking on the

NOTE Confidence: 0.932834187857143

00:26:02.212 --> 00:26:05.018 face you can see the end 170 latency.

NOTE Confidence: 0.932834187857143

00:26:05.020 --> 00:26:07.476 Of the people with autism shown in yellow,

NOTE Confidence: 0.932834187857143

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00:26:07.480 --> 00:26:09.290 the people with typical development

NOTE Confidence: 0.932834187857143

00:26:09.290 --> 00:26:12.876 shown in blue and what you see is that.

NOTE Confidence: 0.932834187857143

00:26:12.880 --> 00:26:16.120 Looking to the eyes.

NOTE Confidence: 0.932834187857143

00:26:16.120 --> 00:26:18.136 Does not make the people with autism

NOTE Confidence: 0.932834187857143

00:26:18.136 --> 00:26:20.953 speed up to be comparable to the

NOTE Confidence: 0.932834187857143

00:26:20.953 --> 00:26:22.369 typically developing counterparts.

NOTE Confidence: 0.932834187857143

00:26:22.370 --> 00:26:23.038 In fact,

NOTE Confidence: 0.932834187857143

00:26:23.038 --> 00:26:25.376 looking to the eyes speeds up the

NOTE Confidence: 0.932834187857143

00:26:25.376 --> 00:26:26.656 typically developing counterparts

NOTE Confidence: 0.932834187857143

00:26:26.656 --> 00:26:29.278 and actually makes this the slowness

NOTE Confidence: 0.932834187857143

00:26:29.278 --> 00:26:32.088 that is from once the slowness comes.

NOTE Confidence: 0.932834187857143

00:26:32.090 --> 00:26:33.282 That's that actually enhances

NOTE Confidence: 0.932834187857143

00:26:33.282 --> 00:26:34.772 the differences that we see,

NOTE Confidence: 0.932834187857143

00:26:34.780 --> 00:26:36.320 and so in terms of our worrying

NOTE Confidence: 0.932834187857143

00:26:36.320 --> 00:26:37.490 about what we're measuring,

NOTE Confidence: 0.932834187857143

00:26:37.490 --> 00:26:39.779 it seems that these N 170 differences

NOTE Confidence: 0.932834187857143

00:26:39.779 --> 00:26:42.467 are not simply an artifact of the way

NOTE Confidence: 0.932834187857143

00:26:42.467 --> 00:26:44.929 people are visually taking in the stimuli,

NOTE Confidence: 0.932834187857143

00:26:44.930 --> 00:26:46.126 but telling us something.

NOTE Confidence: 0.932834187857143

00:26:46.126 --> 00:26:47.920 Different about the way the brain

NOTE Confidence: 0.932834187857143

00:26:47.976 --> 00:26:49.548 response to social information,

NOTE Confidence: 0.932834187857143

00:26:49.550 --> 00:26:51.365 even when the same information

NOTE Confidence: 0.932834187857143

00:26:51.365 --> 00:26:53.602 is reaching the retina and then

NOTE Confidence: 0.932834187857143

00:26:53.602 --> 00:26:55.948 the last really exciting but also

NOTE Confidence: 0.932834187857143

00:26:55.948 --> 00:26:56.980 really preliminary work.

NOTE Confidence: 0.932834187857143

00:26:56.980 --> 00:26:59.230 And this is work that's been been LED in

NOTE Confidence: 0.789527811666667

00:26:59.286 --> 00:27:01.122 Lambi Shashikala, a medical student.

NOTE Confidence: 0.789527811666667

00:27:01.122 --> 00:27:03.138 Max rolison. Right here a soul

NOTE Confidence: 0.789527811666667

00:27:03.138 --> 00:27:05.250 mate fellow like not totally true.

NOTE Confidence: 0.789527811666667

00:27:05.250 --> 00:27:06.970 Also Sparrow fellow in lab.

NOTE Confidence: 0.789527811666667

00:27:06.970 --> 00:27:08.530 Also medical student in lab.

NOTE Confidence: 0.789527811666667

00:27:08.530 --> 00:27:10.930 Also high school student in labs.

NOTE Confidence: 0.789527811666667

00:27:10.930 --> 00:27:12.935 So I don't actually know

NOTE Confidence: 0.789527811666667

00:27:12.935 --> 00:27:15.370 when Max did this work but.

NOTE Confidence: 0.789527811666667

00:27:15.370 --> 00:27:18.184 But Pam Ventola, who's a colleague here,

NOTE Confidence: 0.789527811666667

00:27:18.190 --> 00:27:19.394 the CHILD Study Center,

NOTE Confidence: 0.789527811666667

00:27:19.394 --> 00:27:22.074 who runs at a treatment program using an

NOTE Confidence: 0.789527811666667

00:27:22.074 --> 00:27:24.109 approach called pivotal response treatment,

NOTE Confidence: 0.789527811666667

00:27:24.110 --> 00:27:25.840 which is an empirically validated

NOTE Confidence: 0.789527811666667

00:27:25.840 --> 00:27:27.570 behavioral approach based on the

NOTE Confidence: 0.789527811666667

00:27:27.624 --> 00:27:29.248 premise that teaching children,

NOTE Confidence: 0.789527811666667

00:27:29.250 --> 00:27:31.390 autism, core, social skills,

NOTE Confidence: 0.789527811666667

00:27:31.390 --> 00:27:34.065 and teaching them to have

NOTE Confidence: 0.789527811666667

00:27:34.065 --> 00:27:36.649 fun using them works.

NOTE Confidence: 0.789527811666667

00:27:36.649 --> 00:27:38.698 It's naturalistic intervention,

NOTE Confidence: 0.789527811666667

00:27:38.700 --> 00:27:40.555 and Pam did a course of treatment

NOTE Confidence: 0.789527811666667

00:27:40.555 --> 00:27:42.674 that was 14 weeks and what we did

NOTE Confidence: 0.789527811666667

00:27:42.674 --> 00:27:44.604 is we worked with her so that

NOTE Confidence: 0.789527811666667

00:27:44.604 --> 00:27:46.114 we could measure anyone 70s.

NOTE Confidence: 0.789527811666667

00:27:46.120 --> 00:27:48.145 Before these kids came into

NOTE Confidence: 0.789527811666667

00:27:48.145 --> 00:27:50.170 treatment and then after treatment

NOTE Confidence: 0.789527811666667

00:27:50.170 --> 00:27:52.599 and what we found and this is,

NOTE Confidence: 0.789527811666667

00:27:52.600 --> 00:27:53.380 I say, preliminary.

NOTE Confidence: 0.789527811666667

00:27:53.380 --> 00:27:55.200 This is a very small sample but

NOTE Confidence: 0.789527811666667

00:27:55.253 --> 00:27:56.856 really we I am excited about this

NOTE Confidence: 0.789527811666667

00:27:56.856 --> 00:27:58.804 and we feel that this is something

NOTE Confidence: 0.789527811666667

00:27:58.804 --> 00:28:00.309 important because these kind of

NOTE Confidence: 0.789527811666667

00:28:00.309 --> 00:28:02.160 data don't really exist in autism.

NOTE Confidence: 0.789527811666667

00:28:02.160 --> 00:28:04.900 There are not a lot of kind of pre post

NOTE Confidence: 0.789527811666667

00:28:04.970 --> 00:28:07.640 treatment biomarker studies in autism.

NOTE Confidence: 0.789527811666667

00:28:07.640 --> 00:28:09.614 There will be in a few years

NOTE Confidence: 0.789527811666667

00:28:09.620 --> 00:28:11.160 but we found if so,

NOTE Confidence: 0.789527811666667

00:28:11.160 --> 00:28:13.236 each line on this chart represents

NOTE Confidence: 0.789527811666667

00:28:13.236 --> 00:28:15.202 an individual child in the therapy

NOTE Confidence: 0.789527811666667

00:28:15.202 --> 00:28:17.290 and so you can see there are 7.

NOTE Confidence: 0.789527811666667

00:28:17.290 --> 00:28:19.299 But what we see is pre on

NOTE Confidence: 0.789527811666667

00:28:19.299 --> 00:28:21.190 the left post on the right.

NOTE Confidence: 0.789527811666667

00:28:21.190 --> 00:28:23.224 Everybody got faster except for one

NOTE Confidence: 0.789527811666667

00:28:23.224 --> 00:28:25.638 kid and so remember we're seeing the

NOTE Confidence: 0.789527811666667

00:28:25.638 --> 00:28:27.962 difference is they tend to be slower.

NOTE Confidence: 0.789527811666667

00:28:27.970 --> 00:28:30.112 This is direction we might expect if

NOTE Confidence: 0.789527811666667

00:28:30.112 --> 00:28:32.482 you know if increasing sociability and

NOTE Confidence: 0.789527811666667

00:28:32.482 --> 00:28:35.248 treatment maps on to these biomarkers,

NOTE Confidence: 0.789527811666667

00:28:35.250 --> 00:28:37.986 so you know preliminary but provocative,

NOTE Confidence: 0.789527811666667

00:28:37.990 --> 00:28:39.628 I think worthy of further study.

NOTE Confidence: 0.789527811666667

00:28:39.630 --> 00:28:42.066 Then 170 changes with clinical status.

NOTE Confidence: 0.789527811666667

00:28:42.070 --> 00:28:43.286 So let me review some of the things

NOTE Confidence: 0.789527811666667

00:28:43.286 --> 00:28:44.337 I've told you about the Edmund.

NOTE Confidence: 0.789527811666667

00:28:44.340 --> 00:28:45.142 70, so.

NOTE Confidence: 0.789527811666667

00:28:45.142 --> 00:28:47.147 Thinking back to our checklist,

NOTE Confidence: 0.789527811666667

00:28:47.150 --> 00:28:48.461 we see that.

NOTE Confidence: 0.789527811666667

00:28:48.461 --> 00:28:50.209 Sensitive diagnostic status it's

NOTE Confidence: 0.789527811666667

00:28:50.209 --> 00:28:52.915 associated with symptoms in a way that

NOTE Confidence: 0.789527811666667

00:28:52.915 --> 00:28:54.580 seems to be functionally specific.

NOTE Confidence: 0.789527811666667

00:28:54.580 --> 00:28:56.554 It's the differences that we see

NOTE Confidence: 0.789527811666667

00:28:56.554 --> 00:28:57.870 are consistent across development.

NOTE Confidence: 0.789527811666667

00:28:57.870 --> 00:29:00.606 Their robust to to certain kinds

NOTE Confidence: 0.789527811666667

00:29:00.606 --> 00:29:03.255 of differences in behavior during

NOTE Confidence: 0.789527811666667

00:29:03.255 --> 00:29:04.749 biomarker acquisition.

NOTE Confidence: 0.789527811666667

00:29:04.750 --> 00:29:06.466 They are sensitive to changes in

NOTE Confidence: 0.789527811666667

00:29:06.466 --> 00:29:08.011 clinical status and then remember

NOTE Confidence: 0.789527811666667

00:29:08.011 --> 00:29:09.379 the practical things too.

NOTE Confidence: 0.789527811666667

00:29:09.380 --> 00:29:10.420 And this is a, e.g.,

NOTE Confidence: 0.789527811666667

00:29:10.420 --> 00:29:12.190 so they're also they're viable.

NOTE Confidence: 0.789527811666667

00:29:12.190 --> 00:29:13.790 This is a biomarker technology

NOTE Confidence: 0.789527811666667

00:29:13.790 --> 00:29:16.361 that we can use its cost effective

NOTE Confidence: 0.789527811666667

00:29:16.361 --> 00:29:19.450 and it's accessible. So.

NOTE Confidence: 0.789527811666667

00:29:19.450 --> 00:29:23.027 This is kind of where things were.

NOTE Confidence: 0.789527811666667

00:29:23.030 --> 00:29:25.844 It's a lots of evidence that that

NOTE Confidence: 0.789527811666667

00:29:25.844 --> 00:29:28.777 things like the N 170 can be useful.

NOTE Confidence: 0.789527811666667

00:29:28.780 --> 00:29:30.508 But why are we not at a place

NOTE Confidence: 0.789527811666667

00:29:30.508 --> 00:29:31.590 where they are useful?

NOTE Confidence: 0.789527811666667

00:29:31.590 --> 00:29:33.165 What are some of the remaining challenges?

NOTE Confidence: 0.789527811666667

00:29:33.170 --> 00:29:35.570 First, I want to clarify that you know,

NOTE Confidence: 0.789527811666667

00:29:35.570 --> 00:29:37.382 in case it hasn't been evident

NOTE Confidence: 0.789527811666667

00:29:37.382 --> 00:29:38.910 over my slides so far,

NOTE Confidence: 0.789527811666667

00:29:38.910 --> 00:29:40.470 I'm pretty involved with it.

NOTE Confidence: 0.789527811666667

00:29:40.470 --> 00:29:42.297 And 170, we've got a thing going,

NOTE Confidence: 0.789527811666667

00:29:42.300 --> 00:29:43.980 but there are many,

NOTE Confidence: 0.789527811666667

00:29:43.980 --> 00:29:47.130 many biomarkers worthy of study in autism,

NOTE Confidence: 0.789527811666667

00:29:47.130 --> 00:29:49.594 and so you could tell a similar story.

NOTE Confidence: 0.789527811666667

00:29:49.600 --> 00:29:51.637 For something like an eye tracking biomarker,

NOTE Confidence: 0.789527811666667

00:29:51.640 --> 00:29:52.402 right, UM,

NOTE Confidence: 0.789527811666667

00:29:52.402 --> 00:29:54.688 the truth for all of them.

NOTE Confidence: 0.946086423636364

00:29:54.690 --> 00:29:55.974 Despite extensive promising evidence,

NOTE Confidence: 0.946086423636364

00:29:55.974 --> 00:29:58.320 is that there's problems in one problem.

NOTE Confidence: 0.946086423636364

00:29:58.320 --> 00:30:01.008 For all of them is limited reproducibility.

NOTE Confidence: 0.946086423636364

00:30:01.010 --> 00:30:03.138 So at the bottom of the slide,

NOTE Confidence: 0.946086423636364

00:30:03.140 --> 00:30:06.580 here are all the studies that I am

NOTE Confidence: 0.946086423636364

00:30:06.580 --> 00:30:09.978 aware of that have followed up on our

NOTE Confidence: 0.946086423636364

00:30:09.978 --> 00:30:13.176 initial finding of an M170 delay in 2004.

NOTE Confidence: 0.946086423636364

00:30:13.176 --> 00:30:14.756 So lots of studies right?

NOTE Confidence: 0.946086423636364

00:30:14.760 --> 00:30:16.548 And there's one that I really

NOTE Confidence: 0.946086423636364

00:30:16.548 --> 00:30:18.394 like this Kang one 2018,

NOTE Confidence: 0.946086423636364

00:30:18.394 --> 00:30:20.710 which is actually a meta analysis.

NOTE Confidence: 0.946086423636364

00:30:20.710 --> 00:30:22.110 Which took all these studies.

NOTE Confidence: 0.946086423636364

00:30:22.110 --> 00:30:23.844 Put him into a metal attic

NOTE Confidence: 0.946086423636364

00:30:23.844 --> 00:30:25.357 analytic sausage grinder and said

NOTE Confidence: 0.946086423636364

00:30:25.357 --> 00:30:26.847 wow across all these studies,

NOTE Confidence: 0.946086423636364

00:30:26.850 --> 00:30:29.418 this difference seems to be real and true,

NOTE Confidence: 0.946086423636364

00:30:29.420 --> 00:30:31.922 but there's also studies in this

NOTE Confidence: 0.946086423636364

00:30:31.922 --> 00:30:34.769 mix that didn't find it to be true.

NOTE Confidence: 0.946086423636364

00:30:34.770 --> 00:30:37.822 Why is that? Maybe you know, I.

NOTE Confidence: 0.946086423636364

00:30:37.822 --> 00:30:39.490 I started out saying autism is

NOTE Confidence: 0.946086423636364

00:30:39.556 --> 00:30:41.320 really heterogeneous condition.

NOTE Confidence: 0.946086423636364

00:30:41.320 --> 00:30:42.600 Just like you don't expect,

NOTE Confidence: 0.946086423636364

00:30:42.600 --> 00:30:44.160 just like you might see variation

NOTE Confidence: 0.946086423636364

00:30:44.160 --> 00:30:45.200 in language and autism.

NOTE Confidence: 0.946086423636364

00:30:45.200 --> 00:30:46.736 Maybe you're going to see variation

NOTE Confidence: 0.946086423636364

00:30:46.736 --> 00:30:48.130 in face processing in autism,

NOTE Confidence: 0.946086423636364

00:30:48.130 --> 00:30:49.565 and maybe this is telling us that

NOTE Confidence: 0.946086423636364

00:30:49.565 --> 00:30:50.960 maybe some of these samples didn't

NOTE Confidence: 0.946086423636364

00:30:50.960 --> 00:30:52.424 have an impact to the neural

NOTE Confidence: 0.946086423636364

00:30:52.424 --> 00:30:53.899 system supporting face processing,

NOTE Confidence: 0.946086423636364

00:30:53.900 --> 00:30:56.110 and I think that's OK.

NOTE Confidence: 0.946086423636364

00:30:56.110 --> 00:30:57.727 There are also problems with this literature.

NOTE Confidence: 0.946086423636364

00:30:57.730 --> 00:31:00.406 Some of these studies are underpowered,

NOTE Confidence: 0.946086423636364

00:31:00.410 --> 00:31:00.802 right?

NOTE Confidence: 0.946086423636364

00:31:00.802 --> 00:31:03.546 Which could lead to null results or

NOTE Confidence: 0.946086423636364

00:31:03.546 --> 00:31:06.423 could lead to spurious false positive

NOTE Confidence: 0.946086423636364

00:31:06.423 --> 00:31:09.360 results and a third problem is that

NOTE Confidence: 0.946086423636364

00:31:09.360 --> 00:31:11.750 there's tons of methodological variation.

NOTE Confidence: 0.946086423636364

00:31:11.750 --> 00:31:13.214 We really don't know.

NOTE Confidence: 0.946086423636364

00:31:13.214 --> 00:31:15.410 Doesn't matter if you use color

NOTE Confidence: 0.946086423636364

00:31:15.482 --> 00:31:17.210 faces or grayscale faces,

NOTE Confidence: 0.946086423636364

00:31:17.210 --> 00:31:18.850 happy faces, neutral faces,

NOTE Confidence: 0.946086423636364

00:31:18.850 --> 00:31:21.046 and so the crosshairs, no crosshairs,

NOTE Confidence: 0.946086423636364

00:31:21.046 --> 00:31:23.903 and so all those things are in the mix there

NOTE Confidence: 0.946086423636364

00:31:23.903 --> 00:31:26.175 noise that we can never really pull out.

NOTE Confidence: 0.946086423636364

00:31:26.180 --> 00:31:27.820 From from this this this,

NOTE Confidence: 0.946086423636364

00:31:27.820 --> 00:31:30.310 you know, mixed set of findings.

NOTE Confidence: 0.946086423636364

00:31:30.310 --> 00:31:32.326 There are other things too that there

NOTE Confidence: 0.946086423636364

00:31:32.326 --> 00:31:34.806 are not just kind of noise in the story,

NOTE Confidence: 0.946086423636364

00:31:34.810 --> 00:31:36.889 but are gaping holes in the story.

NOTE Confidence: 0.946086423636364

00:31:36.890 --> 00:31:38.775 We didn't really understand reliability

NOTE Confidence: 0.946086423636364

00:31:38.775 --> 00:31:41.140 of this measure within a person.

NOTE Confidence: 0.946086423636364

00:31:41.140 --> 00:31:42.820 Overtime or practice effects.

NOTE Confidence: 0.946086423636364

00:31:42.820 --> 00:31:43.660 You know,

NOTE Confidence: 0.946086423636364

00:31:43.660 --> 00:31:45.988 if you're going to be doing a biomarker,

NOTE Confidence: 0.946086423636364

00:31:45.990 --> 00:31:46.776 for example,

NOTE Confidence: 0.946086423636364

00:31:46.776 --> 00:31:49.134 over the course of an intervention,

NOTE Confidence: 0.946086423636364

00:31:49.140 --> 00:31:51.499 does the act of measuring the biomarker

NOTE Confidence: 0.946086423636364

00:31:51.499 --> 00:31:52.960 changed the biomarker values?

NOTE Confidence: 0.946086423636364

00:31:52.960 --> 00:31:55.180 Those things are unknown.

NOTE Confidence: 0.946086423636364

00:31:55.180 --> 00:31:57.652 We also don't have any kind of normative

NOTE Confidence: 0.946086423636364

00:31:57.652 --> 00:31:59.159 reference which is challenging.

NOTE Confidence: 0.946086423636364

00:31:59.160 --> 00:31:59.886 So for.

NOTE Confidence: 0.946086423636364

00:31:59.886 --> 00:32:02.064 And a contrast would be head

NOTE Confidence: 0.946086423636364

00:32:02.064 --> 00:32:03.698 circumference where you could go

NOTE Confidence: 0.946086423636364

00:32:03.698 --> 00:32:06.023 to the CDC website and say for any

NOTE Confidence: 0.946086423636364

00:32:06.023 --> 00:32:08.463 given child you know how they fall in

NOTE Confidence: 0.946086423636364

00:32:08.463 --> 00:32:10.499 terms of percentile rank for their head size.

NOTE Confidence: 0.946086423636364

00:32:10.500 --> 00:32:12.705 We don't know that for things like the N.

NOTE Confidence: 0.946086423636364

00:32:12.710 --> 00:32:15.246 170 and so it makes it really hard

NOTE Confidence: 0.946086423636364

00:32:15.246 --> 00:32:17.193 your ability to infer a difference

NOTE Confidence: 0.946086423636364

00:32:17.193 --> 00:32:19.578 is only as strong as the control

NOTE Confidence: 0.946086423636364

00:32:19.578 --> 00:32:21.828 sample in that particular study.

NOTE Confidence: 0.946086423636364

00:32:21.830 --> 00:32:23.888 All these things are things that

NOTE Confidence: 0.946086423636364

00:32:23.888 --> 00:32:27.064 I think of as problems that are

NOTE Confidence: 0.946086423636364

00:32:27.064 --> 00:32:29.364 solvable through empirical research,

NOTE Confidence: 0.946086423636364

00:32:29.370 --> 00:32:31.810 and So what I think we need are

NOTE Confidence: 0.946086423636364

00:32:31.810 --> 00:32:33.660 studies that are more rigorous

NOTE Confidence: 0.946086423636364

00:32:33.660 --> 00:32:35.610 and where those could lead.

NOTE Confidence: 0.946086423636364

00:32:35.610 --> 00:32:36.144 You know,

NOTE Confidence: 0.946086423636364

00:32:36.144 --> 00:32:37.479 really what's the threshold that

NOTE Confidence: 0.946086423636364

00:32:37.479 --> 00:32:39.670 we have to get to before we have

NOTE Confidence: 0.946086423636364

00:32:39.670 --> 00:32:40.738 useful biomarkers for autism

NOTE Confidence: 0.946086423636364

00:32:40.738 --> 00:32:42.268 is FDA qualification right?

NOTE Confidence: 0.946086423636364

00:32:42.270 --> 00:32:44.260 Because there are people who

NOTE Confidence: 0.946086423636364

00:32:44.260 --> 00:32:46.250 are really thinking about that.

NOTE Confidence: 0.946086423636364

00:32:46.250 --> 00:32:48.578 What should those studies look like?

NOTE Confidence: 0.93335224375

00:32:48.580 --> 00:32:51.265 Well, they should test well

00:32:51.265 --> 00:32:52.876 evidenced biomarkers right?

00:32:52.880 --> 00:32:54.360 And that's intuitive, right?

00:32:54.360 --> 00:32:56.580 That's what we should do well.

00:32:56.580 --> 00:32:58.828 So those of you who also write grants,

00:32:58.830 --> 00:33:00.760 no, that's a challenge, right?

00:33:00.760 --> 00:33:03.073 It's really hard to get the 41st

00:33:03.073 --> 00:33:05.404 study of the N 170 funded because

00:33:05.404 --> 00:33:07.848 of the emphasis on innovation.

00:33:07.850 --> 00:33:09.516 I think we have a system that

00:33:09.516 --> 00:33:11.905 sets us up to chase the next best

00:33:11.905 --> 00:33:13.951 potential thing rather than dig in

00:33:13.951 --> 00:33:15.836 and understand really solid things.

00:33:15.840 --> 00:33:17.716 But studies need to do to test.

00:33:17.720 --> 00:33:19.061 Well, evidence biomarkers.

00:33:19.061 --> 00:33:21.296 We need well characterized cohorts,

00:33:21.300 --> 00:33:23.505 so we can understand relationships

00:33:23.505 --> 00:33:24.551 with symptomatology, right?

00:33:24.551 --> 00:33:26.296 If we don't measure it, we can't understand.

00:33:26.296 --> 00:33:27.856 There's a relationship with face

00:33:27.856 --> 00:33:29.309 processing for face recognition.

00:33:29.310 --> 00:33:31.926 For example, we need big samples,

00:33:31.930 --> 00:33:34.065 including big samples of typical

00:33:34.065 --> 00:33:35.346 typically developing kids.

00:33:35.350 --> 00:33:37.793 So we start to get that normative

00:33:37.793 --> 00:33:39.610 reference that I described,

00:33:39.610 --> 00:33:41.290 and we need a longitudinal design

00:33:41.290 --> 00:33:43.410 that lets us look not longitudinal,

00:33:43.410 --> 00:33:45.408 like lifespan, but that'd be great.

00:33:45.410 --> 00:33:47.336 But logitudinal like let's us understand

00:33:47.336 --> 00:33:49.467 even the stability of some of these

00:33:49.467 --> 00:33:51.051 markers over what would be the

NOTE Confidence: 0.93335224375

00:33:51.051 --> 00:33:52.819 length of a typical clinical trial.

NOTE Confidence: 0.93335224375

00:33:52.820 --> 00:33:53.802 You know,

NOTE Confidence: 0.93335224375

00:33:53.802 --> 00:33:56.257 six weeks to six months.

NOTE Confidence: 0.93335224375

00:33:56.260 --> 00:33:59.324 We would want to to be methodologically tight

NOTE Confidence: 0.93335224375

00:33:59.324 --> 00:34:02.489 so that we don't have noise in our data,

NOTE Confidence: 0.93335224375

00:34:02.490 --> 00:34:02.805 right?

NOTE Confidence: 0.93335224375

00:34:02.805 --> 00:34:04.065 Making sure we're being

NOTE Confidence: 0.93335224375

00:34:04.065 --> 00:34:05.325 rigorous about the systems,

NOTE Confidence: 0.93335224375

00:34:05.330 --> 00:34:07.170 the EG systems we use the the way

NOTE Confidence: 0.93335224375

00:34:07.170 --> 00:34:08.983 we think about stimulating and then

NOTE Confidence: 0.93335224375

00:34:08.983 --> 00:34:10.921 we want to use practical assays.

NOTE Confidence: 0.93335224375

00:34:10.930 --> 00:34:13.702 And these are all the different

NOTE Confidence: 0.93335224375

00:34:13.702 --> 00:34:16.074 kinds of principles that were in

NOTE Confidence: 0.93335224375

00:34:16.074 --> 00:34:18.830 the mix when they put out an RFA.

NOTE Confidence: 0.93335224375

00:34:18.830 --> 00:34:19.141 Now,

NOTE Confidence: 0.93335224375

67

00:34:19.141 --> 00:34:21.629 six years ago for to start a consortium

NOTE Confidence: 0.93335224375

00:34:21.629 --> 00:34:23.844 to try to take biomarkers and get

NOTE Confidence: 0.93335224375

00:34:23.844 --> 00:34:26.260 them to a place where they could.

NOTE Confidence: 0.93335224375

00:34:26.260 --> 00:34:28.270 Actually be useful in clinical

NOTE Confidence: 0.93335224375

00:34:28.270 --> 00:34:29.476 trials and autism,

NOTE Confidence: 0.93335224375

00:34:29.480 --> 00:34:30.530 and we've we've been doing

NOTE Confidence: 0.93335224375

00:34:30.530 --> 00:34:31.890 that for the past six years.

NOTE Confidence: 0.93335224375

00:34:31.890 --> 00:34:34.182 It's called the Autism Biomarkers Consortium

NOTE Confidence: 0.93335224375

00:34:34.182 --> 00:34:36.152 for clinical trials, and it there.

NOTE Confidence: 0.93335224375

00:34:36.152 --> 00:34:37.796 There are a number of unique

NOTE Confidence: 0.93335224375

00:34:37.796 --> 00:34:38.610 features about it.

NOTE Confidence: 0.93335224375

00:34:38.610 --> 00:34:40.460 It's a multi site study.

NOTE Confidence: 0.93335224375

00:34:40.460 --> 00:34:41.580 It's a naturalistic study,

NOTE Confidence: 0.93335224375

00:34:41.580 --> 00:34:43.600 meaning that it's not a clinical trial.

NOTE Confidence: 0.93335224375

00:34:43.600 --> 00:34:45.013 There's no intervention,

NOTE Confidence: 0.93335224375

00:34:45.013 --> 00:34:46.426 administer we passively.

NOTE Confidence: 0.93335224375

00:34:46.430 --> 00:34:47.369 We measure intervention

NOTE Confidence: 0.93335224375

00:34:47.369 --> 00:34:48.308 the children received,

NOTE Confidence: 0.93335224375

00:34:48.310 --> 00:34:49.526 but we really passively

NOTE Confidence: 0.93335224375

00:34:49.526 --> 00:34:50.438 observing these biomarkers.

NOTE Confidence: 0.93335224375

00:34:50.440 --> 00:34:51.916 Overtime it's it's structured

NOTE Confidence: 0.93335224375

00:34:51.916 --> 00:34:53.392 such that the administrative

NOTE Confidence: 0.93335224375

00:34:53.392 --> 00:34:55.247 core is right here at Yale.

NOTE Confidence: 0.93335224375

00:34:55.250 --> 00:34:57.054 We have five sites.

NOTE Confidence: 0.93335224375

00:34:57.054 --> 00:34:59.309 Duke UCLA University of Washington,

NOTE Confidence: 0.93335224375

00:34:59.310 --> 00:35:02.070 Boston Children's Hospital and hear

NOTE Confidence: 0.93335224375

00:35:02.070 --> 00:35:04.290 a data coordinating kick core that's

NOTE Confidence: 0.93335224375

00:35:04.290 --> 00:35:06.988 built here at and YCINY cast and

NOTE Confidence: 0.93335224375

00:35:06.988 --> 00:35:09.018 then a distributed data acquisition

NOTE Confidence: 0.93335224375

00:35:09.018 --> 00:35:11.428 analysis Corner that has components here.

NOTE Confidence: 0.93335224375

00:35:11.430 --> 00:35:13.254 But other places really taking the

NOTE Confidence: 0.93335224375

00:35:13.254 --> 00:35:15.299 people who are the best analysts

NOTE Confidence: 0.93335224375

00:35:15.299 --> 00:35:17.603 and technologists for some of these

NOTE Confidence: 0.93335224375

00:35:17.603 --> 00:35:19.468 biomarker methods like eye tracking,

NOTE Confidence: 0.93335224375

00:35:19.470 --> 00:35:19.863 e.g.,

NOTE Confidence: 0.93335224375

00:35:19.863 --> 00:35:23.007 and pulling them in from wherever they are.

NOTE Confidence: 0.93335224375

00:35:23.010 --> 00:35:25.692 It was a big study in our in our

NOTE Confidence: 0.93335224375

00:35:25.692 --> 00:35:27.878 first phase we saw 280 children.

NOTE Confidence: 0.93335224375

00:35:27.878 --> 00:35:28.746 With autism,

NOTE Confidence: 0.93335224375

00:35:28.746 --> 00:35:30.916 119 children with typical development,

NOTE Confidence: 0.93335224375

00:35:30.920 --> 00:35:33.776 which is big for a for for

NOTE Confidence: 0.93335224375

00:35:33.776 --> 00:35:35.680 neuroscience study in autism.

NOTE Confidence: 0.93335224375

00:35:35.680 --> 00:35:38.137 The age range was school age 6

NOTE Confidence: 0.93335224375

00:35:38.137 --> 00:35:41.114 to 11 and IQ range of 60 to 150

NOTE Confidence: 0.93335224375

00:35:41.114 --> 00:35:43.178 to include people who would fall

NOTE Confidence: 0.93335224375

00:35:43.178 --> 00:35:45.624 in the range of an intellectual

NOTE Confidence: 0.93335224375

00:35:45.624 --> 00:35:48.294 disability but also kind of balancing.

NOTE Confidence: 0.935156267272727

00:35:48.300 --> 00:35:48.912 Balancing throughput.

NOTE Confidence: 0.935156267272727

00:35:48.912 --> 00:35:51.640 You know one of the trade offs is the.

NOTE Confidence: 0.935156267272727

00:35:51.640 --> 00:35:54.760 The more the the the the the more lower

NOTE Confidence: 0.935156267272727

00:35:54.760 --> 00:35:57.729 IQ kids you include in a study,

NOTE Confidence: 0.935156267272727

00:35:57.730 --> 00:36:00.710 the more data you will lose and so this is

NOTE Confidence: 0.935156267272727

00:36:00.789 --> 00:36:03.917 the way we balance in this particular study.

NOTE Confidence: 0.935156267272727

00:36:03.920 --> 00:36:05.688 I'll tell you about a study that we're

NOTE Confidence: 0.935156267272727

00:36:05.688 --> 00:36:07.308 that we're doing to try to fix that.

NOTE Confidence: 0.935156267272727

00:36:07.310 --> 00:36:08.942 We use practical assays like EEG

NOTE Confidence: 0.935156267272727

00:36:08.942 --> 00:36:10.808 and I tracking a lot of tools.

NOTE Confidence: 0.935156267272727

00:36:10.810 --> 00:36:12.538 I'm with the baseline in six weeks to let

NOTE Confidence: 0.935156267272727

00:36:12.538 --> 00:36:14.357 us look at stability in the short term,

NOTE Confidence: 0.935156267272727

00:36:14.360 --> 00:36:15.932 and then 24 weeks,

NOTE Confidence: 0.935156267272727

00:36:15.932 --> 00:36:18.290 so six months to let us.

NOTE Confidence: 0.935156267272727

00:36:18.290 --> 00:36:20.030 Potentially picked up unchanged with

NOTE Confidence: 0.935156267272727

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00:36:20.030 --> 00:36:21.770 development or change in response

NOTE Confidence: 0.935156267272727

00:36:21.821 --> 00:36:23.336 to the interventions that these

NOTE Confidence: 0.935156267272727

00:36:23.336 --> 00:36:25.152 children were receiving and a blood

NOTE Confidence: 0.935156267272727

00:36:25.152 --> 00:36:26.888 draw so that we have the opportunity

NOTE Confidence: 0.935156267272727

00:36:26.888 --> 00:36:29.172 to look at genetic information

NOTE Confidence: 0.935156267272727

00:36:29.172 --> 00:36:31.548 alongside these biomarker data.

NOTE Confidence: 0.935156267272727

00:36:31.550 --> 00:36:33.014 The other aspects of this study

NOTE Confidence: 0.935156267272727

00:36:33.014 --> 00:36:34.390 that we're kind of unique.

NOTE Confidence: 0.935156267272727

00:36:34.390 --> 00:36:35.950 It's a it's funded by a

NOTE Confidence: 0.935156267272727

00:36:35.950 --> 00:36:37.280 mechanism called EU 19 was,

NOTE Confidence: 0.935156267272727

00:36:37.280 --> 00:36:39.030 which is a cooperative agreement.

NOTE Confidence: 0.935156267272727

00:36:39.030 --> 00:36:41.190 So this study meets with

NOTE Confidence: 0.935156267272727

00:36:41.190 --> 00:36:42.486 the steering committee.

NOTE Confidence: 0.935156267272727

00:36:42.490 --> 00:36:44.156 Will I'll be on the phone with

NOTE Confidence: 0.935156267272727

00:36:44.156 --> 00:36:46.094 a whole bunch of people at 3:00

NOTE Confidence: 0.935156267272727

00:36:46.094 --> 00:36:47.846 o'clock today and the the governance

NOTE Confidence: 0.935156267272727

00:36:47.903 --> 00:36:49.713 brings together people in these

NOTE Confidence: 0.935156267272727

00:36:49.713 --> 00:36:51.523 academic sites that I've described,

NOTE Confidence: 0.935156267272727

00:36:51.530 --> 00:36:53.396 but also people who are scientists

NOTE Confidence: 0.935156267272727

00:36:53.396 --> 00:36:55.950 at NIH and also people who are

NOTE Confidence: 0.935156267272727

00:36:55.950 --> 00:36:58.030 scientists and industry and also

NOTE Confidence: 0.935156267272727

00:36:58.030 --> 00:36:59.738 regulatory agencies like the FDA.

NOTE Confidence: 0.935156267272727

00:36:59.740 --> 00:37:01.644 So lots and lots of diverse expertise.

NOTE Confidence: 0.935156267272727

00:37:01.650 --> 00:37:03.442 Relevant to these to this to the

NOTE Confidence: 0.935156267272727

00:37:03.442 --> 00:37:04.838 science and the regulatory process

NOTE Confidence: 0.935156267272727

00:37:04.838 --> 00:37:07.102 is brought to bear on the work and

NOTE Confidence: 0.935156267272727

00:37:07.161 --> 00:37:08.979 really another thing that we need.

NOTE Confidence: 0.935156267272727

00:37:08.980 --> 00:37:11.444 But the study is truly I don't

NOTE Confidence: 0.935156267272727

00:37:11.444 --> 00:37:13.140 use this word glibly,

NOTE Confidence: 0.935156267272727

00:37:13.140 --> 00:37:14.540 unprecedented level of rigor in

NOTE Confidence: 0.935156267272727

00:37:14.540 --> 00:37:16.539 terms of we ran this study like

NOTE Confidence: 0.935156267272727

00:37:16.539 --> 00:37:17.884 it was a clinical trial.

NOTE Confidence: 0.935156267272727

00:37:17.890 --> 00:37:18.540 You know,

NOTE Confidence: 0.935156267272727

00:37:18.540 --> 00:37:20.490 like with site monitors coming in

NOTE Confidence: 0.935156267272727

00:37:20.490 --> 00:37:22.504 and double checking which boxes are

NOTE Confidence: 0.935156267272727

00:37:22.504 --> 00:37:25.000 checked in the checked on the folders.

NOTE Confidence: 0.935156267272727

00:37:25.000 --> 00:37:25.590 Methodologically,

NOTE Confidence: 0.935156267272727

00:37:25.590 --> 00:37:28.323 every site you know, people,

NOTE Confidence: 0.935156267272727

00:37:28.323 --> 00:37:30.188 people swapped out their monitors,

NOTE Confidence: 0.935156267272727

00:37:30.190 --> 00:37:32.233 Even so that we would have the exact same.

NOTE Confidence: 0.935156267272727

00:37:32.240 --> 00:37:34.424 Computers displaying the stimuli to the kids,

NOTE Confidence: 0.935156267272727

00:37:34.430 --> 00:37:36.215 making sure that the temperatures in the

NOTE Confidence: 0.935156267272727

00:37:36.215 --> 00:37:38.220 lights in the rooms are all equivalent.

NOTE Confidence: 0.935156267272727

00:37:38.220 --> 00:37:40.268 So really being trying to limit as many

NOTE Confidence: 0.935156267272727

00:37:40.268 --> 00:37:42.270 sources of potential noise as we could,

NOTE Confidence: 0.935156267272727

00:37:42.270 --> 00:37:44.050 and then statistically you know,

NOTE Confidence: 0.935156267272727

00:37:44.050 --> 00:37:44.960 for those of you involved.

NOTE Confidence: 0.935156267272727

00:37:44.960 --> 00:37:47.697 In EG research you can output may

NOTE Confidence: 0.935156267272727

00:37:47.697 --> 00:37:50.424 be an infinite number of dependent

NOTE Confidence: 0.935156267272727

00:37:50.424 --> 00:37:52.869 variables from an experiment and

NOTE Confidence: 0.935156267272727

00:37:52.869 --> 00:37:55.888 what we did so that we would be,

NOTE Confidence: 0.935156267272727

00:37:55.890 --> 00:37:57.552 you know, aboveboard and clear with

NOTE Confidence: 0.935156267272727

00:37:57.552 --> 00:37:59.440 the FDA about what we thought is,

NOTE Confidence: 0.935156267272727

00:37:59.440 --> 00:38:01.498 you know, we picked one, e.g.,

NOTE Confidence: 0.935156267272727

00:38:01.498 --> 00:38:01.996 biomarkers.

NOTE Confidence: 0.935156267272727

00:38:01.996 --> 00:38:04.486 Primary one eye tracking biomarkers

NOTE Confidence: 0.935156267272727

00:38:04.486 --> 00:38:06.484 primary picked one dependent

NOTE Confidence: 0.935156267272727

00:38:06.484 --> 00:38:08.619 variable for each of those,

NOTE Confidence: 0.935156267272727

00:38:08.620 --> 00:38:10.870 and then made a directional hypothesis.

NOTE Confidence: 0.935156267272727

00:38:10.870 --> 00:38:13.208 So lots and lots of data coming

NOTE Confidence: 0.935156267272727

00:38:13.208 --> 00:38:14.809 down essentially to at Test.

NOTE Confidence: 0.935156267272727

00:38:14.810 --> 00:38:15.720 To say whether it works,

NOTE Confidence: 0.935156267272727

00:38:15.720 --> 00:38:17.030 but at least it's unambiguous

NOTE Confidence: 0.935156267272727

00:38:17.030 --> 00:38:18.340 they were not P hat.

NOTE Confidence: 0.935156267272727

00:38:18.340 --> 00:38:21.252 And then lastly we harmonized our work with

NOTE Confidence: 0.935156267272727

00:38:21.252 --> 00:38:24.068 a European consortium doing similar work.

NOTE Confidence: 0.935156267272727

00:38:24.070 --> 00:38:26.380 The European aims to trials at the

NOTE Confidence: 0.935156267272727

00:38:26.380 --> 00:38:28.729 time was called EU aims so that

NOTE Confidence: 0.935156267272727

00:38:28.729 --> 00:38:30.667 we now have two samples collected

NOTE Confidence: 0.883348044583333

00:38:30.738 --> 00:38:32.518 within some different ways,

NOTE Confidence: 0.883348044583333

00:38:32.520 --> 00:38:34.806 but using some of the exact

NOTE Confidence: 0.883348044583333

00:38:34.806 --> 00:38:35.949 same biomarker assays,

NOTE Confidence: 0.883348044583333

00:38:35.950 --> 00:38:38.014 which is really powerful in terms

NOTE Confidence: 0.883348044583333

00:38:38.014 --> 00:38:39.390 of understanding replik ability.

NOTE Confidence: 0.883348044583333

00:38:39.390 --> 00:38:40.600 I won't go through all

NOTE Confidence: 0.883348044583333

00:38:40.600 --> 00:38:41.810 the things on this slide,

NOTE Confidence: 0.883348044583333

00:38:41.810 --> 00:38:44.820 this is just to make the point that we did.

NOTE Confidence: 0.883348044583333

00:38:44.820 --> 00:38:48.340 The status quo in our field is parent

NOTE Confidence: 0.883348044583333

00:38:48.340 --> 00:38:50.430 report measures and clinician rating

NOTE Confidence: 0.883348044583333

00:38:50.430 --> 00:38:53.494 scales and we did the gauntlet of

NOTE Confidence: 0.883348044583333

00:38:53.494 --> 00:38:56.194 ones that are considered useful today.

NOTE Confidence: 0.883348044583333

00:38:56.200 --> 00:38:57.694 The eye tracking and EG measures

NOTE Confidence: 0.883348044583333

00:38:57.694 --> 00:38:59.240 that we use there were four,

NOTE Confidence: 0.883348044583333

00:38:59.240 --> 00:39:02.310 e.g., measures.

NOTE Confidence: 0.883348044583333

00:39:02.310 --> 00:39:05.680 Five eye tracking measures we.

NOTE Confidence: 0.883348044583333

00:39:05.680 --> 00:39:07.288 I won't go into all of them on.

NOTE Confidence: 0.883348044583333

00:39:07.290 --> 00:39:09.330 I'll continue the narrative that I've

NOTE Confidence: 0.883348044583333

00:39:09.330 --> 00:39:11.729 started so far and clarify that the

NOTE Confidence: 0.883348044583333

00:39:11.730 --> 00:39:14.690 ERP's defaces is is one of those markers,

NOTE Confidence: 0.883348044583333

00:39:14.690 --> 00:39:17.610 and I'll show you what we learned about.

NOTE Confidence: 0.883348044583333

00:39:17.610 --> 00:39:19.476 In terms of that that marker.

NOTE Confidence: 0.953269755384615

00:39:22.800 --> 00:39:24.948 So. Some of the things that

NOTE Confidence: 0.953269755384615

00:39:24.948 --> 00:39:27.660 that we we saw in this study.

NOTE Confidence: 0.953269755384615

00:39:27.660 --> 00:39:30.620 One is that we can get data reliably

NOTE Confidence: 0.953269755384615

00:39:30.620 --> 00:39:33.458 from this population so you can see

NOTE Confidence: 0.953269755384615

00:39:33.458 --> 00:39:36.632 here we got valid signal from 97% of

NOTE Confidence: 0.953269755384615

00:39:36.632 --> 00:39:39.264 the typical 11 kids to almost everybody

NOTE Confidence: 0.953269755384615

00:39:39.264 --> 00:39:41.500 in 76% of the kids with autism.

NOTE Confidence: 0.953269755384615

00:39:41.500 --> 00:39:44.790 So not everybody but 3/4.

NOTE Confidence: 0.953269755384615

00:39:44.790 --> 00:39:46.824 We saw our hypothesis that the

NOTE Confidence: 0.953269755384615

00:39:46.824 --> 00:39:49.432 end 170 would be slower in people

NOTE Confidence: 0.953269755384615

00:39:49.432 --> 00:39:51.000 with autism was true.

NOTE Confidence: 0.953269755384615

00:39:51.000 --> 00:39:52.692 So you can see this difference

NOTE Confidence: 0.953269755384615

00:39:52.692 --> 00:39:55.086 around 210 to 100.

NOTE Confidence: 0.953269755384615

00:39:55.086 --> 00:39:58.470 96 milliseconds in case people are wondering.

NOTE Confidence: 0.953269755384615

00:39:58.470 --> 00:40:00.556 Then once it's called the N 170,

NOTE Confidence: 0.953269755384615

00:40:00.560 --> 00:40:02.296 it's not a rule that it happens

NOTE Confidence: 0.953269755384615

00:40:02.296 --> 00:40:04.060 at anyone at 170 milliseconds,

NOTE Confidence: 0.953269755384615

00:40:04.060 --> 00:40:05.605 and actually it doesn't really

NOTE Confidence: 0.953269755384615

00:40:05.605 --> 00:40:07.523 get to be 170 milliseconds until

NOTE Confidence: 0.953269755384615

00:40:07.523 --> 00:40:09.153 people are around 14 years old.

NOTE Confidence: 0.953269755384615

00:40:09.153 --> 00:40:10.539 Starts out much slower and then

NOTE Confidence: 0.953269755384615

00:40:10.539 --> 00:40:11.708 speeds up over development,

NOTE Confidence: 0.953269755384615

00:40:11.710 --> 00:40:14.896 so these numbers aren't aren't unusual.

NOTE Confidence: 0.953269755384615

00:40:14.900 --> 00:40:16.185 You know, these are reasonable

NOTE Confidence: 0.953269755384615

00:40:16.185 --> 00:40:17.470 numbers for kids this age.

NOTE Confidence: 0.953269755384615

00:40:17.470 --> 00:40:20.445 We got a sense of stability overtime,

NOTE Confidence: 0.953269755384615

00:40:20.450 --> 00:40:22.232 which is OK.

NOTE Confidence: 0.953269755384615

00:40:22.232 --> 00:40:24.608 Our statisticians cloud classified.

NOTE Confidence: 0.953269755384615

00:40:24.610 --> 00:40:25.495 This is adequate,

NOTE Confidence: 0.953269755384615

00:40:25.495 --> 00:40:27.265 so we measure this with an

NOTE Confidence: 0.953269755384615

00:40:27.265 --> 00:40:28.910 interclass correlation coefficient.

NOTE Confidence: 0.953269755384615

00:40:28.910 --> 00:40:29.914 Six weeks,

NOTE Confidence: 0.953269755384615

00:40:29.914 --> 00:40:32.749 it's basically how well a person's

NOTE Confidence: 0.953269755384615

00:40:32.749 --> 00:40:34.344 values correlate with their own

NOTE Confidence: 0.953269755384615

00:40:34.344 --> 00:40:36.390 values at a subsequent point in time,

NOTE Confidence: 0.953269755384615

00:40:36.390 --> 00:40:37.476 and so for.

NOTE Confidence: 0.953269755384615

00:40:37.476 --> 00:40:39.440 Typically developing kids about .75

NOTE Confidence: 0.953269755384615

00:40:39.440 --> 00:40:42.500 for autism .66 and pretty similar

NOTE Confidence: 0.953269755384615

00:40:42.500 --> 00:40:45.630 over a longer period of time.

NOTE Confidence: 0.953269755384615

00:40:45.630 --> 00:40:47.090 .75 for the typically developing

NOTE Confidence: 0.953269755384615

00:40:47.090 --> 00:40:49.570 kids and then .56 for the kids

NOTE Confidence: 0.953269755384615

00:40:49.570 --> 00:40:51.570 with autism we saw relationship

NOTE Confidence: 0.953269755384615

00:40:51.570 --> 00:40:54.168 with phenotype in a specific way.

NOTE Confidence: 0.953269755384615

00:40:54.170 --> 00:40:56.081 The kinds of things that we've seen

NOTE Confidence: 0.953269755384615

00:40:56.081 --> 00:40:58.035 in prior studies that this was

NOTE Confidence: 0.953269755384615

00:40:58.035 --> 00:40:59.840 associated specifically with face memory.

NOTE Confidence: 0.953269755384615

00:40:59.840 --> 00:41:02.275 And we also have predictive

NOTE Confidence: 0.953269755384615

00:41:02.275 --> 00:41:05.202 relationships such that ones and 170

NOTE Confidence: 0.953269755384615

00:41:05.202 --> 00:41:08.288 at a baseline told us something about

00:41:08.288 --> 00:41:11.412 their their face memory 24 weeks

00:41:11.412 --> 00:41:12.900 down the line, and so you can see,

00:41:12.900 --> 00:41:13.810 you know this is what it is.

00:41:13.810 --> 00:41:15.050 Just another example of what

00:41:15.050 --> 00:41:16.290 an end 170 looks like.

00:41:16.290 --> 00:41:17.920 You can see the people

00:41:17.920 --> 00:41:19.224 with autism are slower.

00:41:19.230 --> 00:41:20.542 This is the distribution,

00:41:20.542 --> 00:41:22.991 the the the we we present our

00:41:22.991 --> 00:41:24.639 data and stacked histograms,

00:41:24.640 --> 00:41:26.551 and so we're seeing the the people

00:41:26.551 --> 00:41:28.799 here eat the length of each bar is

00:41:28.799 --> 00:41:30.810 the number of people with the value.

00:41:30.810 --> 00:41:33.204 The lower it is on the Y axis is,

00:41:33.210 --> 00:41:36.830 the faster than 170 and So what you see is,

00:41:36.830 --> 00:41:38.874 the mean isn't marked on this chart.

NOTE Confidence: 0.953269755384615

00:41:38.880 --> 00:41:40.250 But then there's this tail.

NOTE Confidence: 0.953269755384615

00:41:40.250 --> 00:41:41.890 The distribution where people

NOTE Confidence: 0.953269755384615

00:41:41.890 --> 00:41:43.940 are slower that is predominantly

NOTE Confidence: 0.953269755384615

00:41:43.940 --> 00:41:45.659 populated by people with autism,

NOTE Confidence: 0.953269755384615

00:41:45.660 --> 00:41:47.505 and this is a great example of the kinds

NOTE Confidence: 0.953269755384615

00:41:47.505 --> 00:41:49.438 of things that I I was saying earlier.

NOTE Confidence: 0.953269755384615

00:41:49.440 --> 00:41:52.023 This would not be a useful biomarker

NOTE Confidence: 0.953269755384615

00:41:52.023 --> 00:41:54.117 of the diagnostic condition, right?

NOTE Confidence: 0.953269755384615

00:41:54.117 --> 00:41:56.410 'cause if you look when a person has an end,

NOTE Confidence: 0.953269755384615

00:41:56.410 --> 00:41:58.200 170 of you know whatever.

NOTE Confidence: 0.953269755384615

00:41:58.200 --> 00:42:01.000 This is 225, you know they could be.

NOTE Confidence: 0.953269755384615

00:42:01.000 --> 00:42:02.216 They're slower than average,

NOTE Confidence: 0.953269755384615

00:42:02.216 --> 00:42:03.736 but they could be typically

NOTE Confidence: 0.953269755384615

00:42:03.736 --> 00:42:04.449 developing as well,

NOTE Confidence: 0.953269755384615

00:42:04.450 --> 00:42:06.410 so but I'll tell you in a

NOTE Confidence: 0.953269755384615

00:42:06.410 --> 00:42:08.613 moment the way we do think it

NOTE Confidence: 0.953269755384615

00:42:08.613 --> 00:42:10.545 could be useful as a biomarker.

NOTE Confidence: 0.953269755384615

00:42:10.550 --> 00:42:11.846 And we're doing OK for time,

NOTE Confidence: 0.953269755384615

00:42:11.850 --> 00:42:14.526 so I'll mention one of the

NOTE Confidence: 0.953269755384615

00:42:14.526 --> 00:42:17.150 things that's that is that is.

NOTE Confidence: 0.937707968

00:42:17.150 --> 00:42:20.240 This design is naturalistic study.

NOTE Confidence: 0.937707968

00:42:20.240 --> 00:42:23.198 Of grade school kids. There's not.

NOTE Confidence: 0.937707968

00:42:23.200 --> 00:42:26.056 We found there was not a ton of

NOTE Confidence: 0.937707968

00:42:26.056 --> 00:42:27.919 clinical change in these kids,

NOTE Confidence: 0.937707968

00:42:27.920 --> 00:42:30.080 which is is not totally unexpected.

NOTE Confidence: 0.937707968

00:42:30.080 --> 00:42:31.820 And kids who are getting treatment

NOTE Confidence: 0.937707968

00:42:31.820 --> 00:42:33.540 as usual and have been now.

NOTE Confidence: 0.937707968

00:42:33.540 --> 00:42:34.494 Hopefully you know,

NOTE Confidence: 0.937707968

00:42:34.494 --> 00:42:36.720 since they were three years old and

NOTE Confidence: 0.937707968

00:42:36.778 --> 00:42:39.118 so our data set does not give us an

NOTE Confidence: 0.937707968

00:42:39.118 --> 00:42:40.997 excellent opportunity to understand

NOTE Confidence: 0.937707968

00:42:40.997 --> 00:42:42.557 relationships between biomarkers

NOTE Confidence: 0.937707968

00:42:42.557 --> 00:42:44.637 and predicting change overtime.

NOTE Confidence: 0.937707968

00:42:44.640 --> 00:42:46.620 Or quantifying how biomarkers

NOTE Confidence: 0.937707968

00:42:46.620 --> 00:42:49.095 parallel changes in clinical status.

NOTE Confidence: 0.937707968

00:42:49.100 --> 00:42:50.264 So what they did.

NOTE Confidence: 0.937707968

00:42:50.264 --> 00:42:53.181 Give us though is is a level of

NOTE Confidence: 0.937707968

00:42:53.181 --> 00:42:55.926 assuredness that these findings are

NOTE Confidence: 0.937707968

00:42:55.926 --> 00:42:58.660 biologically meaningful and again.

NOTE Confidence: 0.937707968

00:42:58.660 --> 00:43:00.208 As a person who's been studying

NOTE Confidence: 0.937707968

00:43:00.208 --> 00:43:01.810 neuroscience and autism for a long time,

NOTE Confidence: 0.937707968

00:43:01.810 --> 00:43:04.768 who's been studying the N 170 since 2004,

NOTE Confidence: 0.937707968

00:43:04.768 --> 00:43:05.187 right?

NOTE Confidence: 0.937707968

00:43:05.187 --> 00:43:09.051 This was the first time I felt like we've

NOTE Confidence: 0.937707968

00:43:09.051 --> 00:43:13.010 got something like this is not a small study.

NOTE Confidence: 0.937707968

00:43:13.010 --> 00:43:15.606 This is not a fluke with, you know,

NOTE Confidence: 0.937707968

00:43:15.606 --> 00:43:18.322 we said this was going to happen.

NOTE Confidence: 0.937707968

00:43:18.330 --> 00:43:20.297 There's a lot of people watching us.

NOTE Confidence: 0.937707968

00:43:20.300 --> 00:43:21.611 Nothing funny happened.

NOTE Confidence: 0.937707968

00:43:21.611 --> 00:43:24.670 This is this is a biological truth,

NOTE Confidence: 0.937707968

00:43:24.670 --> 00:43:27.510 and with that we felt we

NOTE Confidence: 0.937707968

00:43:27.510 --> 00:43:28.730 were in a position to.

NOTE Confidence: 0.937707968

00:43:28.730 --> 00:43:30.836 To go to the FDA so the FDA has

NOTE Confidence: 0.937707968

00:43:30.836 --> 00:43:33.507 a program designed to evaluate

NOTE Confidence: 0.937707968

00:43:33.507 --> 00:43:35.274 biomarkers for qualification,

NOTE Confidence: 0.937707968

00:43:35.280 --> 00:43:36.159 there's three steps.

NOTE Confidence: 0.937707968

00:43:36.159 --> 00:43:37.624 The first step is to

NOTE Confidence: 0.937707968

00:43:37.624 --> 00:43:39.268 submit a letter of intent,

NOTE Confidence: 0.937707968

00:43:39.270 --> 00:43:40.630 basically presenting the data

NOTE Confidence: 0.937707968

00:43:40.630 --> 00:43:42.990 that you have so far and and,

NOTE Confidence: 0.937707968

00:43:42.990 --> 00:43:45.240 and the FDA can say kind of thumbs up.

NOTE Confidence: 0.937707968

00:43:45.240 --> 00:43:47.304 We want to hear more about this or,

NOTE Confidence: 0.937707968

00:43:47.310 --> 00:43:48.190 you know, thumbs down.

NOTE Confidence: 0.937707968

00:43:48.190 --> 00:43:48.850 It just doesn't.

NOTE Confidence: 0.937707968

00:43:48.850 --> 00:43:50.608 Doesn't seem like it has potential,

NOTE Confidence: 0.937707968

00:43:50.610 --> 00:43:52.644 and for both the N 170 and an eye

NOTE Confidence: 0.937707968

00:43:52.644 --> 00:43:54.387 tracking index that I didn't talk

NOTE Confidence: 0.937707968

00:43:54.387 --> 00:43:55.842 about today called the active

NOTE Confidence: 0.937707968

00:43:55.902 --> 00:43:57.627 Remote Indexof case Human Faces,

NOTE Confidence: 0.937707968

00:43:57.630 --> 00:43:59.275 which is exactly what it sounds like.

NOTE Confidence: 0.937707968

00:43:59.280 --> 00:44:01.548 How much people look at the faces on screen?

NOTE Confidence: 0.937707968

00:44:01.550 --> 00:44:03.066 They accepted both so.

NOTE Confidence: 0.937707968

00:44:03.066 --> 00:44:05.340 This does not mean anything in

NOTE Confidence: 0.937707968

00:44:05.418 --> 00:44:07.683 terms of the practical utility

NOTE Confidence: 0.937707968

00:44:07.683 --> 00:44:09.495 of these biomarkers today.

NOTE Confidence: 0.937707968

00:44:09.500 --> 00:44:12.790 But what it does mean is that.

NOTE Confidence: 0.937707968

00:44:12.790 --> 00:44:13.756 These are the.

NOTE Confidence: 0.937707968

00:44:13.756 --> 00:44:15.688 It's a milestone in that these

NOTE Confidence: 0.937707968

00:44:15.688 --> 00:44:18.111 are the first two biomarkers for

NOTE Confidence: 0.937707968

00:44:18.111 --> 00:44:20.146 any psychiatric condition to have

NOTE Confidence: 0.937707968

00:44:20.217 --> 00:44:23.297 been welcomed by the FDA into this

NOTE Confidence: 0.937707968

00:44:23.297 --> 00:44:24.617 biomarker qualification program.

NOTE Confidence: 0.937707968

00:44:24.620 --> 00:44:27.430 So we've got a lot.

NOTE Confidence: 0.937707968

00:44:27.430 --> 00:44:30.006 A lot of work to do before they

NOTE Confidence: 0.937707968

00:44:30.006 --> 00:44:30.650 get qualified,

NOTE Confidence: 0.937707968

00:44:30.650 --> 00:44:33.163 but it's encouraging that this is the

NOTE Confidence: 0.937707968

00:44:33.163 --> 00:44:36.176 first time the FDA said is go do the work.

NOTE Confidence: 0.937707968

00:44:36.180 --> 00:44:37.110 And that's what we're doing.

NOTE Confidence: 0.937707968

00:44:37.110 --> 00:44:38.568 The way that we've described it

NOTE Confidence: 0.937707968

00:44:38.568 --> 00:44:40.410 is that maybe when we think about

NOTE Confidence: 0.937707968

00:44:40.410 --> 00:44:41.775 this tail of the distribution,

NOTE Confidence: 0.937707968

00:44:41.780 --> 00:44:43.340 this represents a subgroup that

NOTE Confidence: 0.937707968

00:44:43.340 --> 00:44:45.190 could be useful in some way.

NOTE Confidence: 0.937707968

00:44:45.190 --> 00:44:47.350 So maybe there are biology

NOTE Confidence: 0.937707968

00:44:47.350 --> 00:44:48.646 is more homogeneous,

NOTE Confidence: 0.937707968

00:44:48.650 --> 00:44:52.328 and maybe then bye bye struck,

NOTE Confidence: 0.937707968

00:44:52.330 --> 00:44:54.270 using them as a stratification

NOTE Confidence: 0.937707968

00:44:54.270 --> 00:44:55.822 factor in clinical trials,

NOTE Confidence: 0.937707968

00:44:55.830 --> 00:44:57.430 we could reduce heterogeneity and

NOTE Confidence: 0.937707968

00:44:57.430 --> 00:44:59.631 have more power to Dec differences

NOTE Confidence: 0.937707968

00:44:59.631 --> 00:45:01.260 associated with treatment.

NOTE Confidence: 0.937707968

00:45:01.260 --> 00:45:01.989 We've, you know,

NOTE Confidence: 0.937707968

00:45:01.989 --> 00:45:03.447 this is one of the things

NOTE Confidence: 0.937707968

00:45:03.447 --> 00:45:04.588 that's really fun about.

NOTE Confidence: 0.937707968

00:45:04.590 --> 00:45:06.460 This is that, you know.

NOTE Confidence: 0.937707968

00:45:06.460 --> 00:45:07.876 We don't know what we're doing,

NOTE Confidence: 0.937707968

00:45:07.880 --> 00:45:09.860 but really nobody does like the

NOTE Confidence: 0.937707968

00:45:09.860 --> 00:45:12.229 FDA is figuring out how you

NOTE Confidence: 0.937707968

00:45:12.229 --> 00:45:14.185 think about qualifying biomarkers

NOTE Confidence: 0.937707968

00:45:14.185 --> 00:45:15.652 by psychiatric conditions,

NOTE Confidence: 0.937707968

00:45:15.660 --> 00:45:17.316 and so this is something very

NOTE Confidence: 0.937707968

00:45:17.316 --> 00:45:18.420 much that we're all

NOTE Confidence: 0.867533435

00:45:18.420 --> 00:45:21.258 we afield are figuring out together,

NOTE Confidence: 0.867533435

00:45:21.260 --> 00:45:23.348 and so we've gotten two grants from the

NOTE Confidence: 0.867533435

00:45:23.348 --> 00:45:25.121 FDA really just support our communication

NOTE Confidence: 0.867533435

00:45:25.121 --> 00:45:27.553 with them to kind of think about these

NOTE Confidence: 0.867533435

00:45:27.553 --> 00:45:29.317 things and develop the next step,

NOTE Confidence: 0.867533435

00:45:29.320 --> 00:45:31.120 which the biomarker qualification

NOTE Confidence: 0.867533435

00:45:31.120 --> 00:45:33.820 plan and it's hard and exciting.

NOTE Confidence: 0.867533435

00:45:33.820 --> 00:45:35.276 The kinds of things that just to

NOTE Confidence: 0.867533435

00:45:35.276 --> 00:45:37.160 give you a taste of the things that.

NOTE Confidence: 0.867533435

00:45:37.160 --> 00:45:38.188 We wrangle with it.

NOTE Confidence: 0.867533435

00:45:38.188 --> 00:45:40.162 I'm gonna again that I'll be wrangling

NOTE Confidence: 0.867533435

00:45:40.162 --> 00:45:42.037 with three o'clock this afternoon

NOTE Confidence: 0.867533435

00:45:42.037 --> 00:45:43.831 and a big teleconferences. How?

NOTE Confidence: 0.867533435

00:45:43.831 --> 00:45:46.450 What kind of data do we provide to show

NOTE Confidence: 0.867533435

00:45:46.522 --> 00:45:48.946 that that purple highlighted group is

NOTE Confidence: 0.867533435

00:45:48.946 --> 00:45:51.689 different from the rest of them somehow?

NOTE Confidence: 0.867533435

00:45:51.690 --> 00:45:53.610 And how do I decide where to draw

NOTE Confidence: 0.867533435

00:45:53.610 --> 00:45:55.298 the line of the purple right?

NOTE Confidence: 0.867533435

00:45:55.300 --> 00:45:56.574 I just did it 'cause it looked

NOTE Confidence: 0.867533435

00:45:56.574 --> 00:45:58.018 nice at that place in the figure,

NOTE Confidence: 0.867533435

00:45:58.020 --> 00:45:59.340 but there should be a more

NOTE Confidence: 0.867533435

00:45:59.340 --> 00:46:00.400 sophisticated way to do it.

NOTE Confidence: 0.867533435

00:46:00.400 --> 00:46:03.400 How do we? How do we validate it?

NOTE Confidence: 0.867533435

00:46:03.400 --> 00:46:05.056 Like if if that's a subgroup,

NOTE Confidence: 0.867533435

00:46:05.060 --> 00:46:07.284 what do you do like when our clinical

NOTE Confidence: 0.867533435

00:46:07.284 --> 00:46:08.957 measures are all that we've got?

NOTE Confidence: 0.867533435

00:46:08.960 --> 00:46:10.605 Should I be doing brain should be

NOTE Confidence: 0.867533435

00:46:10.605 --> 00:46:12.169 doing imaging scans and show that

NOTE Confidence: 0.867533435

00:46:12.169 --> 00:46:13.524 their brain structure is different?

NOTE Confidence: 0.867533435

00:46:13.530 --> 00:46:14.108 Some way,

NOTE Confidence: 0.867533435

00:46:14.108 --> 00:46:16.131 like how can I externally validate this

NOTE Confidence: 0.867533435

00:46:16.131 --> 00:46:17.738 thing that appears to be meaningful

NOTE Confidence: 0.867533435

00:46:17.738 --> 00:46:19.690 with the N 170 and then lastly,

NOTE Confidence: 0.867533435

00:46:19.690 --> 00:46:21.058 how do I make sure and this is

NOTE Confidence: 0.867533435

00:46:21.058 --> 00:46:21.910 a real challenge?

NOTE Confidence: 0.867533435

00:46:21.910 --> 00:46:23.953 How do we make sure that people who do

NOTE Confidence: 0.867533435

00:46:23.953 --> 00:46:25.767 things with with without an unprecedented

NOTE Confidence: 0.867533435

00:46:25.767 --> 00:46:28.220 level of rigor are getting the same results?

NOTE Confidence: 0.867533435

00:46:28.220 --> 00:46:30.004 Do you need to use our EG system?

NOTE Confidence: 0.867533435

00:46:30.010 --> 00:46:32.106 Do you need to use our like manuals

NOTE Confidence: 0.867533435

00:46:32.106 --> 00:46:32.630 and procedures?

NOTE Confidence: 0.867533435

00:46:32.630 --> 00:46:34.238 We don't know?

NOTE Confidence: 0.867533435

00:46:34.240 --> 00:46:35.686 In July 2020,

NOTE Confidence: 0.867533435

00:46:35.686 --> 00:46:39.810 the ABC was funded for a second phase.

NOTE Confidence: 0.867533435

00:46:39.810 --> 00:46:41.454 This new this second phase is

NOTE Confidence: 0.867533435

00:46:41.454 --> 00:46:42.950 going to have three parts.

NOTE Confidence: 0.867533435

00:46:42.950 --> 00:46:44.840 One is going to be a follow-up

NOTE Confidence: 0.867533435

00:46:44.840 --> 00:46:46.954 study of that original cohort coming

NOTE Confidence: 0.867533435

00:46:46.954 --> 00:46:49.656 back 2 1/2 years to four years

NOTE Confidence: 0.867533435

00:46:49.656 --> 00:46:51.180 after their original enrollment.

NOTE Confidence: 0.867533435

00:46:51.180 --> 00:46:52.818 This will let us look at

NOTE Confidence: 0.867533435

00:46:52.818 --> 00:46:54.240 stability over the longer term.

NOTE Confidence: 0.867533435

00:46:54.240 --> 00:46:55.410 It might, as I said,

NOTE Confidence: 0.867533435

00:46:55.410 --> 00:46:57.066 that we were not a study

NOTE Confidence: 0.867533435

00:46:57.066 --> 00:46:58.870 designed to pick up unchanged,

NOTE Confidence: 0.867533435

00:46:58.870 --> 00:47:00.263 but there may be more change that

NOTE Confidence: 0.867533435

00:47:00.263 --> 00:47:01.768 happens over this longer period of time,

NOTE Confidence: 0.867533435

00:47:01.770 --> 00:47:03.778 so we might look into some and it'll

NOTE Confidence: 0.867533435

00:47:03.778 --> 00:47:05.822 also for sure give us an opportunity

NOTE Confidence: 0.867533435

00:47:05.822 --> 00:47:08.062 to look at how biomarkers you know

NOTE Confidence: 0.867533435

00:47:08.062 --> 00:47:09.817 whether they have prognostic value.

NOTE Confidence: 0.867533435

00:47:09.820 --> 00:47:10.970 Whether they tell you something

NOTE Confidence: 0.867533435

00:47:10.970 --> 00:47:12.120 about how prisons gonna look,

NOTE Confidence: 0.867533435

00:47:12.120 --> 00:47:15.288 use down the line we started in May and

NOTE Confidence: 0.867533435

00:47:15.288 --> 00:47:18.718 we're 144 kids in which is mahnomen.

NOTE Confidence: 0.867533435

00:47:18.720 --> 00:47:21.440 ABCD is a is an ambitious and hard

NOTE Confidence: 0.867533435

00:47:21.440 --> 00:47:24.266 study to do without COVID and I

NOTE Confidence: 0.867533435

00:47:24.266 --> 00:47:26.761 cannot tell you how impressed I

NOTE Confidence: 0.867533435

00:47:26.761 --> 00:47:29.253 am with the work that the team

NOTE Confidence: 0.867533435

00:47:29.253 --> 00:47:31.626 here yelling all the sites has

NOTE Confidence: 0.867533435

00:47:31.626 --> 00:47:34.110 done to make this happen today.

NOTE Confidence: 0.867533435

00:47:34.110 --> 00:47:36.828 The second part is confirmation study,

NOTE Confidence: 0.867533435

00:47:36.830 --> 00:47:38.810 which is basically to do that

NOTE Confidence: 0.867533435

00:47:38.810 --> 00:47:40.804 first study over again and make

NOTE Confidence: 0.867533435

00:47:40.804 --> 00:47:42.925 sure that we get the same results.

NOTE Confidence: 0.867533435

00:47:42.930 --> 00:47:46.094 Only difference really is we're going to.

NOTE Confidence: 0.867533435

00:47:46.100 --> 00:47:48.572 Do a an even balance of kids with

NOTE Confidence: 0.867533435

00:47:48.572 --> 00:47:50.705 autism and typically having kids so

NOTE Confidence: 0.867533435

00:47:50.705 --> 00:47:53.143 200 in each which actually having

NOTE Confidence: 0.867533435

00:47:53.143 --> 00:47:54.947 more typically governed kids,

NOTE Confidence: 0.903756688

00:47:54.950 --> 00:47:56.775 makes it much more powerful

NOTE Confidence: 0.903756688

00:47:56.775 --> 00:47:59.175 for us to determine how kids

NOTE Confidence: 0.903756688

00:47:59.175 --> 00:48:01.179 with autism differ materially.

NOTE Confidence: 0.903756688

00:48:01.180 --> 00:48:02.662 11 kids, so that's really important

NOTE Confidence: 0.903756688

00:48:02.662 --> 00:48:05.197 for us and then also tossing one of the

NOTE Confidence: 0.903756688

00:48:05.197 --> 00:48:07.348 the assays that didn't work so well.

NOTE Confidence: 0.903756688

00:48:07.350 --> 00:48:09.778 A biological motion essay.

NOTE Confidence: 0.903756688

00:48:09.780 --> 00:48:12.468 And in the last study is a feasibility

NOTE Confidence: 0.903756688

00:48:12.468 --> 00:48:14.983 study in which will come across

NOTE Confidence: 0.903756688

00:48:14.983 --> 00:48:17.454 the consortium C25 kids with autism

NOTE Confidence: 0.903756688

00:48:17.454 --> 00:48:19.038 25 typically developing kids

NOTE Confidence: 0.903756688

00:48:19.038 --> 00:48:21.290 between three to five years old and

NOTE Confidence: 0.903756688

00:48:21.290 --> 00:48:22.986 see whether we can weather this

NOTE Confidence: 0.903756688

00:48:22.986 --> 00:48:24.714 battery is viable in that group,

NOTE Confidence: 0.903756688

00:48:24.720 --> 00:48:25.503 whether it's feasible,

NOTE Confidence: 0.903756688

00:48:25.503 --> 00:48:27.330 and I'm going to segue the last

NOTE Confidence: 0.903756688

00:48:27.378 --> 00:48:28.827 two things I want to talk about

NOTE Confidence: 0.903756688

00:48:28.827 --> 00:48:30.826 are kind of new directions, right?

NOTE Confidence: 0.903756688

00:48:30.826 --> 00:48:35.238 So the the abcte is it is it is

NOTE Confidence: 0.903756688

00:48:35.238 --> 00:48:37.380 glamorous only in its scope, right?

NOTE Confidence: 0.903756688

00:48:37.380 --> 00:48:39.480 It's taking the things that we.

NOTE Confidence: 0.903756688

00:48:39.480 --> 00:48:41.415 Think we understand and double

NOTE Confidence: 0.903756688

00:48:41.415 --> 00:48:42.963 and triple checking right?

NOTE Confidence: 0.903756688

00:48:42.970 --> 00:48:44.476 And the next few things I'll

NOTE Confidence: 0.903756688

95

00:48:44.476 --> 00:48:46.335 talk about are seeing if we can

00:48:46.335 --> 00:48:47.399 understand some new things.

00:48:47.400 --> 00:48:49.157 So one thing is is this is

00:48:49.157 --> 00:48:50.599 what Paul alluded to earlier.

00:48:50.600 --> 00:48:53.165 The N 170 is an output of a brain

00:48:53.165 --> 00:48:55.642 system that supports social perception

00:48:55.642 --> 00:48:58.282 and social perception is probably

00:48:58.282 --> 00:49:00.855 affected in in every disorder studied

00:49:00.855 --> 00:49:03.338 at the Child Study Center, right?

00:49:03.338 --> 00:49:05.928 And one example is schizophrenia.

00:49:05.930 --> 00:49:07.940 And so this is work.

00:49:07.940 --> 00:49:09.620 That is is being carried out now.

00:49:09.620 --> 00:49:10.592 Play Gloria hard.

00:49:10.592 --> 00:49:12.536 There's a hillerbrand postdoc in the

00:49:12.536 --> 00:49:14.539 lab and in collaboration with Jenn

00:49:14.539 --> 00:49:16.609 phosphide who was a postdoc in lab,

NOTE Confidence: 0.903756688

00:49:16.610 --> 00:49:18.320 and now as an assistant professor

NOTE Confidence: 0.903756688

00:49:18.320 --> 00:49:19.175 at Mount Sinai.

NOTE Confidence: 0.903756688

00:49:19.180 --> 00:49:21.854 But what we've done is really collect,

NOTE Confidence: 0.903756688

00:49:21.860 --> 00:49:24.980 kind of lots of different symptom

NOTE Confidence: 0.903756688

00:49:24.980 --> 00:49:27.720 measures for schizophrenia for autism,

NOTE Confidence: 0.903756688

00:49:27.720 --> 00:49:29.028 and the N 170,

NOTE Confidence: 0.903756688

00:49:29.028 --> 00:49:32.680 and done it in a group of people who

NOTE Confidence: 0.903756688

00:49:32.680 --> 00:49:35.335 have autism or have schizophrenia,

NOTE Confidence: 0.903756688

00:49:35.340 --> 00:49:37.772 and this will get give us a chance

NOTE Confidence: 0.903756688

00:49:37.772 --> 00:49:39.791 to understand the way that the

NOTE Confidence: 0.903756688

00:49:39.791 --> 00:49:40.796 kinds of behavioral.

NOTE Confidence: 0.903756688

00:49:40.800 --> 00:49:42.760 Behavioral phenotypes that we

NOTE Confidence: 0.903756688

00:49:42.760 --> 00:49:45.210 see relate to these biomarker.

NOTE Confidence: 0.903756688

00:49:45.210 --> 00:49:48.250 These biomarkers in a way that is not

NOTE Confidence: 0.903756688

00:49:48.250 --> 00:49:50.260 disorder specific because you know,

NOTE Confidence: 0.903756688

97

00:49:50.260 --> 00:49:52.528 uh Oh my goodness Paul left.

NOTE Confidence: 0.903756688

00:49:52.530 --> 00:49:53.850 He told me he had to leave and

NOTE Confidence: 0.903756688

00:49:53.850 --> 00:49:55.514 then I gave him a hard time by

NOTE Confidence: 0.903756688

00:49:55.514 --> 00:49:56.869 asking questions and now he's gone.

NOTE Confidence: 0.903756688

00:49:56.870 --> 00:50:00.150 He wins. I feel guilty.

NOTE Confidence: 0.903756688

00:50:00.150 --> 00:50:02.238 But though so I don't think.

NOTE Confidence: 0.903756688

00:50:02.240 --> 00:50:02.910 And again,

NOTE Confidence: 0.903756688

00:50:02.910 --> 00:50:05.255 I don't think that we need to

NOTE Confidence: 0.903756688

00:50:05.255 --> 00:50:06.490 have biomarkers.

NOTE Confidence: 0.903756688

00:50:06.490 --> 00:50:07.930 That sort of we don't have

NOTE Confidence: 0.903756688

00:50:07.930 --> 00:50:09.310 to sort of specific brains.

NOTE Confidence: 0.903756688

00:50:09.310 --> 00:50:10.930 Why would measuring the brain,

NOTE Confidence: 0.903756688

00:50:10.930 --> 00:50:12.290 although some give you something

NOTE Confidence: 0.903756688

00:50:12.290 --> 00:50:13.422 this disorder specific, right?

NOTE Confidence: 0.903756688

00:50:13.422 --> 00:50:15.294 It's the same systems that are

NOTE Confidence: 0.903756688

00:50:15.294 --> 00:50:16.230 supporting information processing

NOTE Confidence: 0.903756688

00:50:16.281 --> 00:50:17.469 across all these disorders,

NOTE Confidence: 0.903756688

00:50:17.470 --> 00:50:19.210 and so this is an in.

NOTE Confidence: 0.903756688

00:50:19.210 --> 00:50:21.616 Gloria is also very talented mathematician

NOTE Confidence: 0.903756688

00:50:21.616 --> 00:50:23.694 and is applying network analysis,

NOTE Confidence: 0.903756688

00:50:23.694 --> 00:50:25.442 which I'm reasonably confident

NOTE Confidence: 0.903756688

00:50:25.442 --> 00:50:27.814 I will understand by the time

NOTE Confidence: 0.903756688

00:50:27.814 --> 00:50:29.476 she moves on from the lab.

NOTE Confidence: 0.903756688

00:50:29.480 --> 00:50:32.441 Another approach that we're taking is it's

NOTE Confidence: 0.903756688

00:50:32.441 --> 00:50:35.438 really a problem in our field that many,

NOTE Confidence: 0.903756688

00:50:35.440 --> 00:50:35.879 many,

NOTE Confidence: 0.903756688

00:50:35.879 --> 00:50:38.513 many people with autism have Co

NOTE Confidence: 0.903756688

00:50:38.513 --> 00:50:39.830 occurring intellectual disability,

NOTE Confidence: 0.903756688

00:50:39.830 --> 00:50:41.385 and they're really not included

NOTE Confidence: 0.903756688

00:50:41.385 --> 00:50:42.318 in neuroscience research.

NOTE Confidence: 0.903756688

00:50:42.320 --> 00:50:44.378 So what we're doing is failing to

NOTE Confidence: 0.903756688

00:50:44.378 --> 00:50:46.410 study a group that could perhaps

NOTE Confidence: 0.903756688

00:50:46.410 --> 00:50:48.220 benefit most from the things

NOTE Confidence: 0.903756688

00:50:48.220 --> 00:50:50.330 that we're trying to understand.

NOTE Confidence: 0.903756688

00:50:50.330 --> 00:50:51.810 And there's there's many,

NOTE Confidence: 0.903756688

00:50:51.810 --> 00:50:52.920 many good reasons

NOTE Confidence: 0.9158741

00:50:52.920 --> 00:50:54.084 for them being excluded.

NOTE Confidence: 0.9158741

00:50:54.084 --> 00:50:55.352 You know, many good,

NOTE Confidence: 0.9158741

00:50:55.352 --> 00:50:56.716 practical reasons that is,

NOTE Confidence: 0.9158741

00:50:56.720 --> 00:50:59.180 but we have ideas how we can improve on this,

NOTE Confidence: 0.9158741

00:50:59.180 --> 00:50:59.920 and this is work that.

NOTE Confidence: 0.9158741

00:50:59.920 --> 00:51:01.688 Led by Adam Naples, who many of you

NOTE Confidence: 0.9158741

00:51:01.688 --> 00:51:03.483 know who I've worked with for over a

NOTE Confidence: 0.9158741

00:51:03.483 --> 00:51:05.359 decade and is a research scientist,

NOTE Confidence: 0.9158741

00:51:05.360 --> 00:51:07.360 having started in the lab as a postdoc.

NOTE Confidence: 0.9158741

00:51:07.360 --> 00:51:08.730 But what we've we've thought

NOTE Confidence: 0.9158741

00:51:08.730 --> 00:51:10.100 about is over the years.

NOTE Confidence: 0.9158741

00:51:10.100 --> 00:51:12.700 We have ideas about how EGS could be

NOTE Confidence: 0.9158741

00:51:12.700 --> 00:51:14.977 made easier for people with autism,

NOTE Confidence: 0.9158741

00:51:14.980 --> 00:51:17.236 and so a few things changing the way

NOTE Confidence: 0.9158741

00:51:17.236 --> 00:51:18.988 we administer experiments so that,

NOTE Confidence: 0.9158741

00:51:18.990 --> 00:51:21.270 for example, it's a silly thing.

NOTE Confidence: 0.9158741

00:51:21.270 --> 00:51:23.385 But if you show 50 faces in a row

NOTE Confidence: 0.9158741

00:51:23.385 --> 00:51:25.785 and then you show 50 houses in a row,

NOTE Confidence: 0.9158741

00:51:25.790 --> 00:51:27.589 it gets a lot more boring than

NOTE Confidence: 0.9158741

00:51:27.589 --> 00:51:29.695 if you go back and forth, right?

NOTE Confidence: 0.9158741

00:51:29.695 --> 00:51:31.170 So like. Little silly things.

NOTE Confidence: 0.9158741

00:51:31.170 --> 00:51:33.354 Thinking about how a person can

NOTE Confidence: 0.9158741

00:51:33.354 --> 00:51:34.810 experience can improve things.

NOTE Confidence: 0.9158741

00:51:34.810 --> 00:51:37.138 We also would. Adam has done his is.

NOTE Confidence: 0.9158741

00:51:37.140 --> 00:51:38.827 He gets mad when I call it

NOTE Confidence: 0.9158741

00:51:38.827 --> 00:51:39.550 an artificial intelligence.

NOTE Confidence: 0.9158741

00:51:39.550 --> 00:51:40.930 But I'm going to anyway.

NOTE Confidence: 0.9158741

00:51:40.930 --> 00:51:43.506 He's built a way of kind of quantifying

NOTE Confidence: 0.9158741

00:51:43.506 --> 00:51:45.079 simultaneously a person's movement

NOTE Confidence: 0.9158741

00:51:45.079 --> 00:51:46.807 automatically where their faces

NOTE Confidence: 0.9158741

00:51:46.807 --> 00:51:49.297 oriented where their eyes are looking

NOTE Confidence: 0.9158741

00:51:49.297 --> 00:51:51.052 and basically putting that into

NOTE Confidence: 0.9158741

00:51:51.052 --> 00:51:53.052 an algorithm that creates a net.

NOTE Confidence: 0.9158741

00:51:53.052 --> 00:51:53.680 You know,

NOTE Confidence: 0.9158741

00:51:53.680 --> 00:51:54.008 net.

NOTE Confidence: 0.9158741

00:51:54.008 --> 00:51:56.304 How much is this person moving around

NOTE Confidence: 0.9158741

00:51:56.304 --> 00:51:59.144 and then what we do is we just use

NOTE Confidence: 0.9158741

00:51:59.144 --> 00:52:00.959 behavioral shaping in a non person.

NOTE Confidence: 0.9158741

00:52:00.960 --> 00:52:03.360 Based way Nonexperimental based way

NOTE Confidence: 0.9158741

00:52:03.360 --> 00:52:07.354 to to create a set up so that the

NOTE Confidence: 0.9158741

00:52:07.354 --> 00:52:10.310 you know the less they move around.

NOTE Confidence: 0.9158741

00:52:10.310 --> 00:52:12.560 The less tolerant the experimental

NOTE Confidence: 0.9158741

00:52:12.560 --> 00:52:15.316 setup becomes of movement and the

NOTE Confidence: 0.9158741

00:52:15.316 --> 00:52:17.890 incentive is that their favorite videos

NOTE Confidence: 0.9158741

00:52:17.890 --> 00:52:20.449 play when they're not moving a lot,

NOTE Confidence: 0.9158741

00:52:20.450 --> 00:52:22.669 so there's no one saying sit still,

NOTE Confidence: 0.9158741

00:52:22.670 --> 00:52:23.834 look at the screen,

NOTE Confidence: 0.9158741

00:52:23.834 --> 00:52:26.549 it just is a inergen kind of ergonomics,

NOTE Confidence: 0.9158741

00:52:26.550 --> 00:52:27.990 right? And and it works.

NOTE Confidence: 0.9158741

00:52:27.990 --> 00:52:30.965 So we're getting data now from kids.

NOTE Confidence: 0.9158741

00:52:30.970 --> 00:52:32.334 This is just example,

NOTE Confidence: 0.9158741

00:52:32.334 --> 00:52:35.869 this is a person who had an IQ of I believe.

NOTE Confidence: 0.9158741

00:52:35.870 --> 00:52:36.718 I'm actually not sure.

NOTE Confidence: 0.9158741

00:52:36.718 --> 00:52:37.990 I know we've had people come

NOTE Confidence: 0.9158741

00:52:38.040 --> 00:52:39.244 through the Iqs as low as 22.

NOTE Confidence: 0.9158741

00:52:39.250 --> 00:52:40.748 I don't know who's David this is.

NOTE Confidence: 0.9158741

00:52:40.750 --> 00:52:42.311 But but it's working and you can

NOTE Confidence: 0.9158741

00:52:42.311 --> 00:52:44.004 see you know we we don't have

NOTE Confidence: 0.9158741

00:52:44.004 --> 00:52:45.462 enough heated data yet to notice

NOTE Confidence: 0.9158741

00:52:45.512 --> 00:52:46.947 he kind of group differences.

NOTE Confidence: 0.9158741

00:52:46.950 --> 00:52:48.910 But we do see that we see the N 170

NOTE Confidence: 0.9158741

00:52:48.974 --> 00:52:50.745 that we expect and then the last

NOTE Confidence: 0.9158741

00:52:50.745 --> 00:52:52.637 thing in one that I'm really excited

NOTE Confidence: 0.9158741

00:52:52.637 --> 00:52:55.136 about is is maybe we can use some of

NOTE Confidence: 0.9158741

00:52:55.136 --> 00:52:56.888 these biomarkers to actually guide care.

NOTE Confidence: 0.9158741

00:52:56.890 --> 00:52:59.008 And here I'll highlight two residents,

NOTE Confidence: 0.9158741

00:52:59.010 --> 00:52:59.860 Cherub Syringa,

NOTE Confidence: 0.9158741

00:52:59.860 --> 00:53:01.560 who's in the audience,

NOTE Confidence: 0.9158741

00:53:01.560 --> 00:53:02.848 and also AZ Alsop.

NOTE Confidence: 0.9158741

00:53:02.848 --> 00:53:05.659 And this is work really when we think

NOTE Confidence: 0.9158741

00:53:05.659 --> 00:53:07.669 about the treatments for autism,

NOTE Confidence: 0.9158741

00:53:07.670 --> 00:53:09.238 they have a few things in common.

NOTE Confidence: 0.9158741

00:53:09.240 --> 00:53:11.778 They tend to target social function.

104

NOTE Confidence: 0.9158741

00:53:11.780 --> 00:53:13.610 And we know from you know,

NOTE Confidence: 0.9158741

00:53:13.610 --> 00:53:14.670 not a lot of studies,

NOTE Confidence: 0.9158741

00:53:14.670 --> 00:53:16.080 but a few suggestive studies that

NOTE Confidence: 0.9158741

00:53:16.080 --> 00:53:17.509 a particular part of the brain,

NOTE Confidence: 0.9158741

00:53:17.510 --> 00:53:19.580 called the superior temporal sulcus,

NOTE Confidence: 0.9158741

00:53:19.580 --> 00:53:21.686 is is enhanced in activity when

NOTE Confidence: 0.9158741

00:53:21.686 --> 00:53:23.840 people get better in treatment.

NOTE Confidence: 0.9158741

00:53:23.840 --> 00:53:26.018 This is also happened to be one of the

NOTE Confidence: 0.9158741

00:53:26.018 --> 00:53:28.085 places that we think generates then 170,

NOTE Confidence: 0.88407976875

00:53:28.090 --> 00:53:30.306 and an idea that that isn't just ours.

NOTE Confidence: 0.88407976875

00:53:30.310 --> 00:53:31.546 Other groups are doing.

NOTE Confidence: 0.88407976875

00:53:31.546 --> 00:53:32.782 We're actually collaborating with

NOTE Confidence: 0.88407976875

00:53:32.782 --> 00:53:34.601 a group running clinical trial in

NOTE Confidence: 0.88407976875

00:53:34.601 --> 00:53:36.031 Australia is we could directly

NOTE Confidence: 0.88407976875

00:53:36.031 --> 00:53:37.890 use direct brain stimulation with

NOTE Confidence: 0.88407976875

00:53:37.890 --> 00:53:39.033 transcranial magnetic stimulation

NOTE Confidence: 0.88407976875

00:53:39.033 --> 00:53:41.104 TMS to stimulate the tests and and.

NOTE Confidence: 0.88407976875

00:53:41.104 --> 00:53:42.785 You know a couple of studies that

NOTE Confidence: 0.88407976875

00:53:42.785 --> 00:53:44.472 have been done so far suggests that

NOTE Confidence: 0.88407976875

00:53:44.472 --> 00:53:45.937 it could improve social behavior

NOTE Confidence: 0.88407976875

00:53:45.937 --> 00:53:47.797 that it could reduce kind of

NOTE Confidence: 0.88407976875

00:53:47.797 --> 00:53:49.232 repetitive behaviors and autism.

NOTE Confidence: 0.88407976875

00:53:49.232 --> 00:53:51.850 But what we're trying to do really

NOTE Confidence: 0.88407976875

00:53:51.924 --> 00:53:53.960 is leverage our proficiency

NOTE Confidence: 0.88407976875

00:53:53.960 --> 00:53:56.223 in using biomarkers, right?

NOTE Confidence: 0.88407976875

00:53:56.223 --> 00:53:59.146 And so maybe, you know, we could maybe.

NOTE Confidence: 0.88407976875

00:53:59.146 --> 00:54:02.854 And 170 maybe eye tracking could be a

NOTE Confidence: 0.88407976875

00:54:02.854 --> 00:54:06.478 useful way of quantifying in a shorter term,

NOTE Confidence: 0.88407976875

00:54:06.480 --> 00:54:07.788 whether these treatments are

NOTE Confidence: 0.88407976875

00:54:07.788 --> 00:54:09.410 going to be effective, right?

NOTE Confidence: 0.88407976875

00:54:09.410 --> 00:54:10.960 Because to measure change in

NOTE Confidence: 0.88407976875

00:54:10.960 --> 00:54:12.870 social behavior is a tall order,

NOTE Confidence: 0.88407976875

00:54:12.870 --> 00:54:15.903 like I can if you had a pill that

NOTE Confidence: 0.88407976875

00:54:15.903 --> 00:54:17.455 dramatically changed someones

NOTE Confidence: 0.88407976875

00:54:17.455 --> 00:54:19.168 social brain function.

NOTE Confidence: 0.88407976875

00:54:19.170 --> 00:54:20.982 It's not like they would leave

NOTE Confidence: 0.88407976875

00:54:20.982 --> 00:54:21.888 your lab reporting.

NOTE Confidence: 0.88407976875

00:54:21.890 --> 00:54:23.969 They have more friends write these things.

NOTE Confidence: 0.88407976875

00:54:23.970 --> 00:54:25.520 It's an intersection of brain

NOTE Confidence: 0.88407976875

00:54:25.520 --> 00:54:26.450 systems and environment,

NOTE Confidence: 0.88407976875

00:54:26.450 --> 00:54:28.410 and so you know that's a tall order.

NOTE Confidence: 0.88407976875

00:54:28.410 --> 00:54:29.415 Maybe we could see differences

NOTE Confidence: 0.88407976875

00:54:29.415 --> 00:54:30.219 here that would be.

NOTE Confidence: 0.88407976875

00:54:30.220 --> 00:54:31.276 Predictive about the differences

NOTE Confidence: 0.88407976875

00:54:31.276 --> 00:54:32.068 and maybe also,

NOTE Confidence: 0.88407976875

00:54:32.070 --> 00:54:33.942 we could see predictions about who's

NOTE Confidence: 0.88407976875

00:54:33.942 --> 00:54:36.247 going to respond at all and who's not.

NOTE Confidence: 0.88407976875

00:54:36.250 --> 00:54:37.832 Maybe the people with the slowest and

NOTE Confidence: 0.88407976875

00:54:37.832 --> 00:54:39.975 70s are the ones that we should be

NOTE Confidence: 0.88407976875

00:54:39.975 --> 00:54:41.385 providing direct brain stimulation to.

NOTE Confidence: 0.88407976875

00:54:41.390 --> 00:54:42.098 Maybe the opposite.

NOTE Confidence: 0.88407976875

00:54:42.098 --> 00:54:43.750 We don't know what we see so

NOTE Confidence: 0.88407976875

00:54:43.806 --> 00:54:44.986 far and just pilot data.

NOTE Confidence: 0.88407976875

00:54:44.990 --> 00:54:46.838 And this is work will start.

NOTE Confidence: 0.88407976875

00:54:46.840 --> 00:54:48.650 This will start seeing participants

NOTE Confidence: 0.88407976875

00:54:48.650 --> 00:54:53.008 really in earnest in in in December.

NOTE Confidence: 0.88407976875

00:54:53.010 --> 00:54:54.216 These are pilot data that were

NOTE Confidence: 0.88407976875

00:54:54.216 --> 00:54:55.870 part of a grand was recently funded

NOTE Confidence: 0.88407976875

00:54:55.870 --> 00:54:57.210 by the Department of Defense,

NOTE Confidence: 0.88407976875

00:54:57.210 --> 00:54:59.346 but the but we see even in people

NOTE Confidence: 0.88407976875

00:54:59.346 --> 00:55:00.690 who don't have autism,

NOTE Confidence: 0.88407976875

00:55:00.690 --> 00:55:02.706 that it tends to move the needle.

NOTE Confidence: 0.88407976875

00:55:02.710 --> 00:55:04.900 The biomarker needle in the directions

NOTE Confidence: 0.88407976875

00:55:04.900 --> 00:55:07.644 that we would expect we see and when

NOTE Confidence: 0.88407976875

00:55:07.644 --> 00:55:09.462 70s get faster when you stimulate

NOTE Confidence: 0.88407976875

00:55:09.533 --> 00:55:11.612 VSTS and we see people looking more

NOTE Confidence: 0.88407976875

00:55:11.612 --> 00:55:13.251 to eyes when you stimulate VSTS.

NOTE Confidence: 0.88407976875

00:55:13.251 --> 00:55:14.733 It's also not on this slide,

NOTE Confidence: 0.88407976875

00:55:14.740 --> 00:55:16.028 but one of the things I'm really,

NOTE Confidence: 0.88407976875

00:55:16.030 --> 00:55:18.182 really, really, really really,

NOTE Confidence: 0.88407976875

00:55:18.182 --> 00:55:21.740 really excited about is that CHERUB is.

NOTE Confidence: 0.88407976875

00:55:21.740 --> 00:55:23.637 Is it already an expert in TMS?

NOTE Confidence: 0.88407976875

00:55:23.640 --> 00:55:26.214 Because TMS is an FDA approved

NOTE Confidence: 0.88407976875

00:55:26.214 --> 00:55:27.930 treatment for treatment resistant

NOTE Confidence: 0.88407976875

00:55:28.002 --> 00:55:29.934 depression and this is a place

NOTE Confidence: 0.88407976875

00:55:29.934 --> 00:55:32.230 where he has lots of experience.

NOTE Confidence: 0.88407976875

00:55:32.230 --> 00:55:33.634 He lives in our lab halftime

NOTE Confidence: 0.88407976875

00:55:33.634 --> 00:55:34.999 and he lives at the VA,

NOTE Confidence: 0.88407976875

00:55:35.000 --> 00:55:36.405 working in the treatment resistant

NOTE Confidence: 0.88407976875

00:55:36.405 --> 00:55:37.248 depression clinics there.

NOTE Confidence: 0.88407976875

00:55:37.250 --> 00:55:38.888 The other half of the time

NOTE Confidence: 0.88407976875

00:55:38.888 --> 00:55:40.835 and depression is a very very

NOTE Confidence: 0.88407976875

00:55:40.835 --> 00:55:42.419 significant problem in autism.

NOTE Confidence: 0.88407976875

00:55:42.420 --> 00:55:44.845 Many the typical treatments for

NOTE Confidence: 0.88407976875

00:55:44.845 --> 00:55:47.727 depression and autism are not effective

NOTE Confidence: 0.88407976875

00:55:47.727 --> 00:55:50.695 for a host of reasons and TMS is

NOTE Confidence: 0.88407976875

00:55:50.700 --> 00:55:53.717 from my perspective holds great promise for.

NOTE Confidence: 0.88407976875

00:55:53.720 --> 00:55:55.164 Addressing depression and autism.

NOTE Confidence: 0.88407976875

00:55:55.164 --> 00:55:56.608 And that's something that

NOTE Confidence: 0.88407976875

00:55:56.608 --> 00:55:58.259 sheriff is literally shared,

NOTE Confidence: 0.88407976875

00:55:58.260 --> 00:55:59.010 but you would agree, right?

NOTE Confidence: 0.88407976875

00:55:59.010 --> 00:56:00.160 You're probably the best person

NOTE Confidence: 0.88407976875

00:56:00.160 --> 00:56:01.700 on Earth to solve that problem,

NOTE Confidence: 0.88407976875

00:56:01.700 --> 00:56:02.960 right?

NOTE Confidence: 0.88407976875

00:56:02.960 --> 00:56:04.580 But that's something that we're going

NOTE Confidence: 0.88407976875

00:56:04.580 --> 00:56:06.798 to be working on next as well and

NOTE Confidence: 0.88407976875

00:56:06.798 --> 00:56:08.158 shrubs they Hillebrand fell off.

NOTE Confidence: 0.88407976875

00:56:08.160 --> 00:56:08.892 Forgot to mention,

NOTE Confidence: 0.88407976875

00:56:08.892 --> 00:56:10.600 but that's what I wanted to talk

NOTE Confidence: 0.934299440909091

00:56:10.652 --> 00:56:13.020 about. I'm despite my enthusiasm and

NOTE Confidence: 0.934299440909091

00:56:13.020 --> 00:56:14.415 loquaciousness, I'm glad to see I've

NOTE Confidence: 0.934299440909091

00:56:14.415 --> 00:56:15.880 saved a few minutes for questions.

NOTE Confidence: 0.934299440909091

00:56:15.880 --> 00:56:20.040 I I do want to thank a few groups because.

NOTE Confidence: 0.934299440909091

00:56:20.040 --> 00:56:21.580 Mentioned at the outset, you know this.

NOTE Confidence: 0.934299440909091

00:56:21.580 --> 00:56:23.788 This work exists between the clinic

NOTE Confidence: 0.934299440909091

00:56:23.790 --> 00:56:25.295 and the lab, and the consortium is.

NOTE Confidence: 0.934299440909091

00:56:25.300 --> 00:56:26.740 There's a lot of people involved.

NOTE Confidence: 0.934299440909091

00:56:26.740 --> 00:56:28.858 The most important people involved are

NOTE Confidence: 0.934299440909091

00:56:28.858 --> 00:56:31.536 the the the, the people with autism,

NOTE Confidence: 0.934299440909091

00:56:31.536 --> 00:56:33.960 and the families that go through

NOTE Confidence: 0.934299440909091

00:56:34.035 --> 00:56:36.243 the trouble of spending long boring

NOTE Confidence: 0.934299440909091

00:56:36.243 --> 00:56:38.800 days with us to help us learn.

NOTE Confidence: 0.934299440909091

00:56:38.800 --> 00:56:41.188 And we're we're realistic about it.

NOTE Confidence: 0.934299440909091

00:56:41.190 --> 00:56:44.284 In fact, my kids are participants in

NOTE Confidence: 0.934299440909091

00:56:44.284 --> 00:56:47.645 the abcte and my wife lets me know

NOTE Confidence: 0.934299440909091

00:56:47.645 --> 00:56:50.739 just how annoying my my studies are.

NOTE Confidence: 0.934299440909091

00:56:50.740 --> 00:56:52.720 And so and she and we've got a stake in it,

NOTE Confidence: 0.934299440909091

00:56:52.720 --> 00:56:55.478 so we're very grateful for their time.

NOTE Confidence: 0.934299440909091

00:56:55.480 --> 00:56:57.376 We're really grateful for the clinicians

NOTE Confidence: 0.934299440909091

00:56:57.376 --> 00:56:59.000 in the development disabilities clinic.

NOTE Confidence: 0.934299440909091

00:56:59.000 --> 00:57:00.836 Who are are truly world class.

NOTE Confidence: 0.934299440909091

00:57:00.840 --> 00:57:01.604 And that's, I think,

NOTE Confidence: 0.934299440909091

00:57:01.604 --> 00:57:02.559 where all this research begins.

NOTE Confidence: 0.934299440909091

00:57:02.560 --> 00:57:04.066 Because it's probably part of the

NOTE Confidence: 0.934299440909091

00:57:04.066 --> 00:57:05.317 reason that people are willing

NOTE Confidence: 0.934299440909091

00:57:05.317 --> 00:57:06.724 to come in and work with us.

NOTE Confidence: 0.934299440909091

00:57:06.730 --> 00:57:09.362 The Autism Biomarkers Consortium,

NOTE Confidence: 0.934299440909091

00:57:09.362 --> 00:57:12.576 which is really it, is a it is.

NOTE Confidence: 0.934299440909091

00:57:12.580 --> 00:57:14.338 It's been a an amazing experience

NOTE Confidence: 0.934299440909091

00:57:14.338 --> 00:57:16.499 to work with this group of people

NOTE Confidence: 0.934299440909091

00:57:16.499 --> 00:57:18.669 because they're truly in in autism the

NOTE Confidence: 0.934299440909091

00:57:18.730 --> 00:57:20.745 best at what they do in the world.

NOTE Confidence: 0.934299440909091

00:57:20.750 --> 00:57:23.170 And yet they are selfless, tireless,

NOTE Confidence: 0.934299440909091

00:57:23.170 --> 00:57:25.414 and generous without limits.

NOTE Confidence: 0.934299440909091

00:57:25.414 --> 00:57:29.050 And then the people in the lab who who

NOTE Confidence: 0.934299440909091

00:57:29.050 --> 00:57:31.842 this was our first lab meeting after we

NOTE Confidence: 0.934299440909091

00:57:31.920 --> 00:57:34.664 were able to all come back in person.

NOTE Confidence: 0.934299440909091

00:57:34.670 --> 00:57:36.294 But this these are the people who are

NOTE Confidence: 0.934299440909091

00:57:36.294 --> 00:57:38.022 doing the work that I have the pleasure

NOTE Confidence: 0.934299440909091

00:57:38.022 --> 00:57:39.610 of talking with you all about today.

NOTE Confidence: 0.934299440909091

00:57:39.610 --> 00:57:41.465 So thank you all for your attention

NOTE Confidence: 0.934299440909091

00:57:41.465 --> 00:57:43.299 and thank you all for your help.

NOTE Confidence: 0.771427025

00:57:51.400 --> 00:57:54.999 Sure, for. I think thank

NOTE Confidence: 0.771427025

00:57:54.999 --> 00:57:57.464 you very high level here.

NOTE Confidence: 0.71676125875

00:57:59.750 --> 00:58:03.334 Uhm, a lot of your question is fascinating,

NOTE Confidence: 0.71676125875

00:58:03.340 --> 00:58:06.652 but a lot of your questions about specificity

NOTE Confidence: 0.71676125875

00:58:06.652 --> 00:58:08.959 about whether it labels a subtype,

NOTE Confidence: 0.71676125875

00:58:08.960 --> 00:58:10.692 whether it's disorder specific,

NOTE Confidence: 0.71676125875

00:58:10.692 --> 00:58:12.857 how label it isn't stable.

NOTE Confidence: 0.71676125875

00:58:12.860 --> 00:58:14.490 It is, could be answered.

NOTE Confidence: 0.71676125875

00:58:14.490 --> 00:58:15.758 Perhaps if you talk,

NOTE Confidence: 0.71676125875

00:58:15.758 --> 00:58:18.680 or if we know about the neuroscience.

NOTE Confidence: 0.71676125875

00:58:18.680 --> 00:58:22.190 Of N 170, right and.

NOTE Confidence: 0.71676125875

00:58:22.190 --> 00:58:24.647 I'm sure it's been measured in animals

NOTE Confidence: 0.71676125875

00:58:24.650 --> 00:58:26.330 including primates, and I'm sure

NOTE Confidence: 0.71676125875

00:58:26.330 --> 00:58:28.410 people have looked more in depth.

NOTE Confidence: 0.71676125875

00:58:28.410 --> 00:58:29.164 For example,

NOTE Confidence: 0.71676125875

00:58:29.164 --> 00:58:31.426 does it arise in sensory cortices?

NOTE Confidence: 0.71676125875

00:58:31.430 --> 00:58:33.146 But you're talking more about this

NOTE Confidence: 0.71676125875

00:58:33.146 --> 00:58:35.800 is a more maybe more of an emotional

NOTE Confidence: 0.71676125875

00:58:35.800 --> 00:58:37.966 response rather than a cognitive response,

NOTE Confidence: 0.71676125875

00:58:37.970 --> 00:58:39.220 or even a sensory response,

NOTE Confidence: 0.71676125875

00:58:39.220 --> 00:58:42.460 so I'm a little confused about was it,

NOTE Confidence: 0.71676125875

00:58:42.460 --> 00:58:44.784 what is it from a neuroscience standpoint?

NOTE Confidence: 0.71676125875

00:58:44.790 --> 00:58:46.150 Because that could really address

NOTE Confidence: 0.71676125875

00:58:46.150 --> 00:58:47.618 all of these questions, right?

NOTE Confidence: 0.71676125875

00:58:47.618 --> 00:58:49.508 It might, I don't know.

NOTE Confidence: 0.71676125875

00:58:49.510 --> 00:58:51.246 I mean, I think it's it's it's attractive.

NOTE Confidence: 0.71676125875

00:58:51.250 --> 00:58:51.820 The idea?

NOTE Confidence: 0.71676125875

00:58:51.820 --> 00:58:53.815 So, so I hope everyone here floor

NOTE Confidence: 0.71676125875

00:58:53.815 --> 00:58:56.066 is very good question and if I would

NOTE Confidence: 0.71676125875

00:58:56.066 --> 00:58:58.499 if I could paraphrase your question,

NOTE Confidence: 0.71676125875

00:58:58.500 --> 00:59:00.663 it would be like what is the

NOTE Confidence: 0.71676125875

00:59:00.663 --> 00:59:02.758 mechanism that is indexed by the N

NOTE Confidence: 0.71676125875

00:59:02.758 --> 00:59:05.219 170 and the answer is we don't know.

NOTE Confidence: 0.71676125875

00:59:05.220 --> 00:59:05.632 You know,

NOTE Confidence: 0.71676125875

00:59:05.632 --> 00:59:07.870 we know we know kind of where it comes from,

NOTE Confidence: 0.71676125875

00:59:07.870 --> 00:59:08.160 right?

NOTE Confidence: 0.71676125875

00:59:08.160 --> 00:59:09.900 It comes from occipital temporal cortex.

NOTE Confidence: 0.71676125875

00:59:09.900 --> 00:59:11.930 It's an EEG measure, right?

NOTE Confidence: 0.71676125875

00:59:11.930 --> 00:59:14.080 And so it's probably reflecting,

NOTE Confidence: 0.71676125875

00:59:14.080 --> 00:59:15.212 not probably.

NOTE Confidence: 0.71676125875

00:59:15.212 --> 00:59:18.042 It is reflecting activity in

NOTE Confidence: 0.71676125875

00:59:18.042 --> 00:59:19.475 different places, right?

NOTE Confidence: 0.71676125875

00:59:19.475 --> 00:59:21.540 So it's probably STS as I said,

NOTE Confidence: 0.71676125875

00:59:21.540 --> 00:59:22.520 but maybe also fuse.

NOTE Confidence: 0.71676125875

00:59:22.520 --> 00:59:24.332 From Jirus you know we don't have

NOTE Confidence: 0.71676125875

00:59:24.332 --> 00:59:25.757 really perfect ways of measuring

NOTE Confidence: 0.71676125875

00:59:25.757 --> 00:59:27.234 from where a signal recorded

NOTE Confidence: 0.71676125875

00:59:27.234 --> 00:59:28.908 scalp comes from in the brain.

NOTE Confidence: 0.860961210909091

00:59:32.190 --> 00:59:33.750 We know same things like that's

NOTE Confidence: 0.860961210909091

00:59:33.750 --> 00:59:35.360 where it comes like occipital,

NOTE Confidence: 0.860961210909091

00:59:35.360 --> 00:59:36.924 temporal cortex like fusiform

NOTE Confidence: 0.860961210909091

00:59:36.924 --> 00:59:38.097 gyrus across species.

NOTE Confidence: 0.860961210909091

00:59:38.100 --> 00:59:40.764 But even when we know that what then

NOTE Confidence: 0.860961210909091

00:59:40.764 --> 00:59:42.780 what like what do we do with that?

NOTE Confidence: 0.860961210909091

00:59:42.780 --> 00:59:44.532 That's the problem right?

NOTE Confidence: 0.860961210909091

00:59:44.532 --> 00:59:47.699 It's like the we in autism we're

NOTE Confidence: 0.860961210909091

00:59:47.699 --> 00:59:50.870 making all of our decisions based on.

NOTE Confidence: 0.860961210909091

00:59:50.870 --> 00:59:51.872 Perception of behavior.

NOTE Confidence: 0.860961210909091

00:59:51.872 --> 00:59:53.876 One of the things that's nice,

NOTE Confidence: 0.860961210909091

117

00:59:53.880 --> 00:59:56.336 I mean to take the other extreme right?

NOTE Confidence: 0.860961210909091

00:59:56.340 --> 00:59:58.097 Like if we could find a difference

NOTE Confidence: 0.860961210909091

00:59:58.097 --> 00:59:59.725 in a synapse in autism, right?

NOTE Confidence: 0.860961210909091

00:59:59.725 --> 01:00:01.150 That would be a beautiful

NOTE Confidence: 0.860961210909091

01:00:01.150 --> 01:00:02.290 illustration of a mechanism.

NOTE Confidence: 0.860961210909091

01:00:02.290 --> 01:00:04.570 But it wouldn't tell me at all what to do.

NOTE Confidence: 0.860961210909091

01:00:04.570 --> 01:00:05.908 When I go into the clinic,

NOTE Confidence: 0.860961210909091

01:00:05.910 --> 01:00:08.006 and so I think of this as occupying

NOTE Confidence: 0.860961210909091

01:00:08.006 --> 01:00:09.962 kind of an important translational

NOTE Confidence: 0.860961210909091

01:00:09.962 --> 01:00:12.362 space between the really, really

NOTE Confidence: 0.860961210909091

01:00:12.362 --> 01:00:15.854 subjective things that we use presently.

NOTE Confidence: 0.860961210909091

01:00:15.860 --> 01:00:18.422 To things that are convergently presumably

NOTE Confidence: 0.860961210909091

01:00:18.422 --> 01:00:21.917 valid in terms of mapping to those things.

NOTE Confidence: 0.860961210909091

01:00:21.920 --> 01:00:23.492 And closer to mechanism,

NOTE Confidence: 0.860961210909091

01:00:23.492 --> 01:00:25.064 but not mechanisms yet.

NOTE Confidence: 0.860961210909091

01:00:25.070 --> 01:00:27.198 But that's that's the challenge I mean.

NOTE Confidence: 0.860961210909091

01:00:27.200 --> 01:00:28.978 And you mean you're uniquely qualified to

NOTE Confidence: 0.860961210909091

01:00:28.978 --> 01:00:30.988 help me think about how we could define,

NOTE Confidence: 0.860961210909091

01:00:30.988 --> 01:00:33.494 you, know, just to elucidate the mechanism,

NOTE Confidence: 0.860961210909091

01:00:33.500 --> 01:00:35.698 namely 70, but we don't know yet.

NOTE Confidence: 0.860961210909091

01:00:35.700 --> 01:00:35.981 Jamie,

NOTE Confidence: 0.860961210909091

01:00:35.981 --> 01:00:37.667 I think this really dovetails quite

NOTE Confidence: 0.860961210909091

01:00:37.667 --> 01:00:39.432 nicely with the question that we had

NOTE Confidence: 0.860961210909091

01:00:39.432 --> 01:00:41.420 come in on the chat from Zoran Zamolo,

NOTE Confidence: 0.860961210909091

01:00:41.420 --> 01:00:43.296 and he was asking about whether or

NOTE Confidence: 0.860961210909091

01:00:43.296 --> 01:00:45.288 not an increased latency of the N 170

NOTE Confidence: 0.860961210909091

01:00:45.288 --> 01:00:47.188 above 250 milliseconds actually is

NOTE Confidence: 0.860961210909091

01:00:47.188 --> 01:00:49.273 associated with increased severity of

NOTE Confidence: 0.860961210909091

01:00:49.273 --> 01:00:51.255 clinical presentation or increased

NOTE Confidence: 0.860961210909091

01:00:51.255 --> 01:00:53.259 difficulty with social communication.

NOTE Confidence: 0.860961210909091

01:00:53.260 --> 01:00:55.980 No, so this is the thing that is

NOTE Confidence: 0.860961210909091

01:00:55.980 --> 01:00:57.419 this stymied us right?

NOTE Confidence: 0.860961210909091

01:00:57.420 --> 01:00:58.484 So and we have,

NOTE Confidence: 0.860961210909091

01:00:58.484 --> 01:00:59.016 like really,

NOTE Confidence: 0.860961210909091

01:00:59.020 --> 01:01:00.956 really great clever statisticians

NOTE Confidence: 0.860961210909091

01:01:00.956 --> 01:01:03.860 thinking we did every clinical measure.

NOTE Confidence: 0.860961210909091

01:01:03.860 --> 01:01:05.280 And you know what?

NOTE Confidence: 0.860961210909091

01:01:05.280 --> 01:01:07.526 Wouldn't it be awesome if we

NOTE Confidence: 0.860961210909091

01:01:07.526 --> 01:01:09.178 took this in 170?

NOTE Confidence: 0.860961210909091

01:01:09.180 --> 01:01:11.724 We said look this difference that we thought

NOTE Confidence: 0.860961210909091

01:01:11.724 --> 01:01:14.526 was true in this big rigorous study is true,

NOTE Confidence: 0.860961210909091

01:01:14.530 --> 01:01:16.480 and it associate's with the

NOTE Confidence: 0.860961210909091

01:01:16.480 --> 01:01:18.800 phenotype in a really high way.

NOTE Confidence: 0.860961210909091

01:01:18.800 --> 01:01:19.189 Nope,

NOTE Confidence: 0.860961210909091

01:01:19.189 --> 01:01:21.523 you know what associate's with it

NOTE Confidence: 0.860961210909091

01:01:21.523 --> 01:01:24.008 associates with how well you recognize.

NOTE Confidence: 0.860961210909091

01:01:24.010 --> 01:01:25.453 Faces which is.

NOTE Confidence: 0.860961210909091

01:01:25.453 --> 01:01:26.896 Telling us something,

NOTE Confidence: 0.860961210909091

01:01:26.900 --> 01:01:28.993 I think right when we think what

NOTE Confidence: 0.860961210909091

01:01:28.993 --> 01:01:31.291 does it mean to say that something

NOTE Confidence: 0.860961210909091

01:01:31.291 --> 01:01:33.283 I measure like and 170 would

NOTE Confidence: 0.860961210909091

01:01:33.359 --> 01:01:35.287 associate with the phenotype.

NOTE Confidence: 0.860961210909091

01:01:35.290 --> 01:01:36.952 What's the phenotype?

NOTE Confidence: 0.860961210909091

01:01:36.952 --> 01:01:38.060 It's it's.

NOTE Confidence: 0.860961210909091

01:01:38.060 --> 01:01:41.150 It's I contact right, its language,

NOTE Confidence: 0.860961210909091

01:01:41.150 --> 01:01:43.898 its flexibility of behavior.

NOTE Confidence: 0.860961210909091

01:01:43.898 --> 01:01:45.959 It's sensory response.

NOTE Confidence: 0.860961210909091

01:01:45.960 --> 01:01:48.858 What are the odds that one readout

NOTE Confidence: 0.860961210909091

01:01:48.860 --> 01:01:51.860 of one neural system happening?

NOTE Confidence: 0.860961210909091

01:01:51.860 --> 01:01:52.466 You know,

NOTE Confidence: 0.860961210909091

01:01:52.466 --> 01:01:53.072 short latency,

NOTE Confidence: 0.860961210909091

01:01:53.072 --> 01:01:54.587 so it's pretty perceptual is

NOTE Confidence: 0.860961210909091

01:01:54.587 --> 01:01:56.176 going to capture all of those.

NOTE Confidence: 0.860961210909091

01:01:56.180 --> 01:01:58.256 Things we wanted it to happen.

NOTE Confidence: 0.860961210909091

01:01:58.260 --> 01:02:00.020 It didn't happen and I think we have

NOTE Confidence: 0.860961210909091

01:02:00.020 --> 01:02:01.668 to accept that and and understand

NOTE Confidence: 0.860961210909091

01:02:01.668 --> 01:02:03.108 that it's telling us something

NOTE Confidence: 0.860961210909091

01:02:03.108 --> 01:02:04.500 about the biology of autism.

NOTE Confidence: 0.860961210909091

01:02:04.500 --> 01:02:07.020 And again, that's a great like that.

NOTE Confidence: 0.860961210909091

01:02:07.020 --> 01:02:07.604 Question is,

NOTE Confidence: 0.860961210909091

01:02:07.604 --> 01:02:09.356 that's why we got to think

NOTE Confidence: 0.860961210909091

01:02:09.356 --> 01:02:10.938 really carefully about how we

NOTE Confidence: 0.860961210909091

01:02:10.938 --> 01:02:11.877 think about biomarkers.

NOTE Confidence: 0.860961210909091

01:02:11.880 --> 01:02:13.674 That doesn't mean I don't think

NOTE Confidence: 0.860961210909091

01:02:13.674 --> 01:02:15.870 maybe the animal 70 won't be useful,

NOTE Confidence: 0.860961210909091

01:02:15.870 --> 01:02:16.680 but for now,

NOTE Confidence: 0.860961210909091

01:02:16.680 --> 01:02:18.570 it's one of the few things that

NOTE Confidence: 0.860961210909091

01:02:18.641 --> 01:02:20.669 we can presume to be really

NOTE Confidence: 0.860961210909091

01:02:20.669 --> 01:02:22.426 consistently true about how the

NOTE Confidence: 0.860961210909091

01:02:22.426 --> 01:02:24.116 brain is different in autism,

NOTE Confidence: 0.860961210909091

01:02:24.120 --> 01:02:25.108 and so you know,

NOTE Confidence: 0.860961210909091

01:02:25.108 --> 01:02:26.343 to me it makes sense.

NOTE Confidence: 0.8748344

01:02:26.350 --> 01:02:27.148 To look at all the ways,

NOTE Confidence: 0.8748344

01:02:27.150 --> 01:02:28.809 could you be useful 'cause we have

NOTE Confidence: 0.8748344

01:02:28.809 --> 01:02:30.209 nothing better by that standard,

NOTE Confidence: 0.8748344

01:02:30.210 --> 01:02:32.576 but is it a proxy for autism?

NOTE Confidence: 0.8748344

01:02:32.580 --> 01:02:34.330 Per say no? And I don't know

NOTE Confidence: 0.8748344

01:02:34.330 --> 01:02:35.906 that we're going to find a

NOTE Confidence: 0.8748344

01:02:35.906 --> 01:02:37.430 biomarker of this type that is.

NOTE Confidence: 0.845363396153846

01:02:41.140 --> 01:02:42.616 Jamie, that was fantastic.

NOTE Confidence: 0.845363396153846

01:02:42.616 --> 01:02:44.092 You're as passionate as

NOTE Confidence: 0.845363396153846

01:02:44.092 --> 01:02:45.709 you were as an intern.

NOTE Confidence: 0.845363396153846

01:02:45.710 --> 01:02:47.230 I remember so well.

NOTE Confidence: 0.845363396153846

01:02:47.230 --> 01:02:49.130 Quick thing you said that

NOTE Confidence: 0.845363396153846

01:02:49.130 --> 01:02:50.288 biomarkers are controversial.

NOTE Confidence: 0.845363396153846

01:02:50.288 --> 01:02:52.604 Are there safeguards about the misuse

NOTE Confidence: 0.845363396153846

01:02:52.604 --> 01:02:54.980 of biomarkers so that you know people?

NOTE Confidence: 0.845363396153846

01:02:54.980 --> 01:02:57.680 Can you know inappropriately be diagnosed?

NOTE Confidence: 0.845363396153846

01:02:57.680 --> 01:02:59.500 You know, there's a lot of stigma

NOTE Confidence: 0.845363396153846

01:02:59.500 --> 01:03:01.193 that goes along with these diagnosis

NOTE Confidence: 0.845363396153846

01:03:01.193 --> 01:03:03.195 and you know too many people feel

NOTE Confidence: 0.845363396153846

01:03:03.256 --> 01:03:05.111 that if you have autism you can't

NOTE Confidence: 0.845363396153846

01:03:05.111 --> 01:03:07.756 really feel or relate or learn much.

NOTE Confidence: 0.845363396153846

01:03:07.760 --> 01:03:09.308 You know any any.

NOTE Confidence: 0.845363396153846

01:03:09.308 --> 01:03:10.856 Safeguards against the misuse

NOTE Confidence: 0.845363396153846

01:03:10.856 --> 01:03:13.082 of these biomarkers. It's a.

NOTE Confidence: 0.845363396153846

01:03:13.082 --> 01:03:15.273 It's a what a great question, Larry.

NOTE Confidence: 0.845363396153846

01:03:15.273 --> 01:03:17.857 I mean, first we just agree with you

NOTE Confidence: 0.845363396153846

01:03:17.857 --> 01:03:20.381 that thinking about the ethical use

NOTE Confidence: 0.845363396153846

01:03:20.381 --> 01:03:22.373 of biomarkers is critical, right?

NOTE Confidence: 0.845363396153846

01:03:22.373 --> 01:03:24.637 We have one of the we have an

NOTE Confidence: 0.845363396153846

01:03:24.637 --> 01:03:26.369 external Advisory Board for the

NOTE Confidence: 0.845363396153846

01:03:26.370 --> 01:03:28.530 ABCT and John Elder Robison.

NOTE Confidence: 0.845363396153846

01:03:28.530 --> 01:03:30.650 Who's a man with autism?

NOTE Confidence: 0.845363396153846

01:03:30.650 --> 01:03:32.310 And also a uh,

NOTE Confidence: 0.845363396153846

01:03:32.310 --> 01:03:34.745 a very an author and very thoughtful

NOTE Confidence: 0.845363396153846

01:03:34.745 --> 01:03:37.058 person is active and kind of being a,

NOTE Confidence: 0.845363396153846

01:03:37.060 --> 01:03:37.586 you know,

NOTE Confidence: 0.845363396153846

01:03:37.586 --> 01:03:39.427 a voice of a person with autism

NOTE Confidence: 0.845363396153846

01:03:39.427 --> 01:03:41.129 in the context of science,

NOTE Confidence: 0.845363396153846

01:03:41.130 --> 01:03:42.480 and he's been immensely helpful.

NOTE Confidence: 0.845363396153846

01:03:42.480 --> 01:03:44.433 And we had a meeting a few weeks ago,

NOTE Confidence: 0.845363396153846

01:03:44.440 --> 01:03:45.652 and that's one of the things

NOTE Confidence: 0.845363396153846

01:03:45.652 --> 01:03:46.460 he expressed was concerned.

NOTE Confidence: 0.845363396153846

01:03:46.460 --> 01:03:46.736 Like.

NOTE Confidence: 0.845363396153846

01:03:46.736 --> 01:03:48.668 What are people going to put the

NOTE Confidence: 0.845363396153846

01:03:48.668 --> 01:03:50.442 cart before the horse and say the

NOTE Confidence: 0.845363396153846

01:03:50.442 --> 01:03:52.378 point is to get your N 170 faster?

NOTE Confidence: 0.845363396153846

01:03:52.380 --> 01:03:54.480 And might that put people with autism

NOTE Confidence: 0.845363396153846

01:03:54.480 --> 01:03:56.517 in an unfortunate spot where they're

NOTE Confidence: 0.845363396153846

01:03:56.517 --> 01:03:58.665 being put through maybe treatments that.

NOTE Confidence: 0.845363396153846

01:03:58.670 --> 01:03:59.696 Are actually useful,

NOTE Confidence: 0.845363396153846

01:03:59.696 --> 01:04:02.090 improving their quality of lives and so.

NOTE Confidence: 0.845363396153846

01:04:02.090 --> 01:04:03.750 And we agree, we don't.

NOTE Confidence: 0.845363396153846

01:04:03.750 --> 01:04:05.444 I hope it's evident that it's not

NOTE Confidence: 0.845363396153846

01:04:05.444 --> 01:04:07.338 that we don't see these biomarkers as

NOTE Confidence: 0.845363396153846

01:04:07.338 --> 01:04:09.270 an end unto themselves in that way,

NOTE Confidence: 0.845363396153846

01:04:09.270 --> 01:04:11.022 but I don't know the answer

NOTE Confidence: 0.845363396153846

01:04:11.022 --> 01:04:12.190 to your question like.

NOTE Confidence: 0.845363396153846

01:04:12.190 --> 01:04:15.400 I don't know that as scientists.

01:04:15.400 --> 01:04:16.608 You know there I,

01:04:16.608 --> 01:04:19.572 I guess I Arby's RR safeguard against

01:04:19.572 --> 01:04:23.076 kind of ethical misuse of biomarkers,

01:04:23.080 --> 01:04:25.420 but ultimately, you know this.

01:04:25.420 --> 01:04:28.080 It's what people do, Yep.

01:04:28.080 --> 01:04:30.346 And people having being thoughtful one

01:04:30.346 --> 01:04:32.954 last quick question from Bob King on Zoom.

01:04:32.960 --> 01:04:33.474 Yes,

01:04:33.474 --> 01:04:36.558 I was wondering about people with

01:04:36.558 --> 01:04:38.890 prosopagnosia as one of them.

01:04:38.890 --> 01:04:41.265 I think of otherwise normal

01:04:41.265 --> 01:04:43.165 social skills and intelligence.

01:04:43.170 --> 01:04:47.130 Do you do we have abnormal and one 70s.

01:04:47.130 --> 01:04:48.230 It's a good question Bob.

01:04:48.230 --> 01:04:49.718 And there's a handful of studies

01:04:49.718 --> 01:04:51.479 that I haven't read in a long time,

NOTE Confidence: 0.845363396153846

01:04:51.480 --> 01:04:53.881 and people who don't know prosopagnosia is

NOTE Confidence: 0.845363396153846

01:04:53.881 --> 01:04:56.001 a selective inability to recognize faces

NOTE Confidence: 0.845363396153846

01:04:56.001 --> 01:04:58.402 despite being able to recognize other things.

NOTE Confidence: 0.845363396153846

01:04:58.410 --> 01:04:58.856 And honestly,

NOTE Confidence: 0.845363396153846

01:04:58.856 --> 01:04:59.079 Bob,

NOTE Confidence: 0.845363396153846

01:04:59.079 --> 01:05:01.230 I have to go and check the literature there

NOTE Confidence: 0.845363396153846

01:05:01.230 --> 01:05:03.862 is there is a literature both on kind of

NOTE Confidence: 0.845363396153846

01:05:03.862 --> 01:05:05.610 acquired and developmental prosopagnosia.

NOTE Confidence: 0.845363396153846

01:05:05.610 --> 01:05:07.590 And I actually want to say,

NOTE Confidence: 0.845363396153846

01:05:07.590 --> 01:05:08.630 you know, someone can.

NOTE Confidence: 0.845363396153846

01:05:08.630 --> 01:05:10.790 Email me and tell me that I'm wrong,

NOTE Confidence: 0.845363396153846

01:05:10.790 --> 01:05:12.547 but I actually think that they that

NOTE Confidence: 0.845363396153846

01:05:12.547 --> 01:05:14.382 we don't see differences in there and

NOTE Confidence: 0.845363396153846

01:05:14.382 --> 01:05:16.450 170 and they do show and when 70s,

NOTE Confidence: 0.845363396153846

01:05:16.450 --> 01:05:16.689 right?

NOTE Confidence: 0.845363396153846

01:05:16.689 --> 01:05:17.167 That is.

NOTE Confidence: 0.845363396153846

01:05:17.167 --> 01:05:18.601 This is something pretty and when

NOTE Confidence: 0.845363396153846

01:05:18.601 --> 01:05:20.358 we think about it actually when we

NOTE Confidence: 0.845363396153846

01:05:20.358 --> 01:05:21.960 think about the kinds of cognitive

NOTE Confidence: 0.845363396153846

01:05:21.960 --> 01:05:23.688 processes and the way you understand,

NOTE Confidence: 0.845363396153846

01:05:23.690 --> 01:05:25.394 how do you understand what the

NOTE Confidence: 0.845363396153846

01:05:25.394 --> 01:05:26.530 cognitive process indexed by

NOTE Confidence: 0.892859581428571

01:05:26.587 --> 01:05:27.359 and 170 is like?

NOTE Confidence: 0.892859581428571

01:05:27.360 --> 01:05:29.084 You do experimental manipulations

NOTE Confidence: 0.892859581428571

01:05:29.084 --> 01:05:31.239 like show familiar and unfamiliar

NOTE Confidence: 0.892859581428571

01:05:31.239 --> 01:05:33.796 faces and then 170 is not really

NOTE Confidence: 0.892859581428571

01:05:33.796 --> 01:05:35.168 tracking with face recognition.

NOTE Confidence: 0.892859581428571

01:05:35.170 --> 01:05:36.918 Although in our behaviourally

NOTE Confidence: 0.892859581428571

01:05:36.918 --> 01:05:39.540 right it does but in experiments.

NOTE Confidence: 0.892859581428571

01:05:39.540 --> 01:05:42.252 The N 170 seems to index

NOTE Confidence: 0.892859581428571

01:05:42.252 --> 01:05:43.608 face structural encoding,

NOTE Confidence: 0.892859581428571

01:05:43.610 --> 01:05:45.788 whereas later components like an end

NOTE Confidence: 0.892859581428571

01:05:45.788 --> 01:05:48.480 to end 250 index face recognition.

NOTE Confidence: 0.892859581428571

01:05:48.480 --> 01:05:50.056 Does that make sense?

NOTE Confidence: 0.892859581428571

01:05:50.056 --> 01:05:50.890 Yeah, thank you.

NOTE Confidence: 0.854062070625

01:05:58.860 --> 01:06:00.404 And just thank you to all the joined

NOTE Confidence: 0.854062070625

01:06:00.404 --> 01:06:02.219 us on zoom but also in person today.

NOTE Confidence: 0.854062070625

01:06:02.220 --> 01:06:03.210 This is a fantastic talk.

NOTE Confidence: 0.854062070625

01:06:03.210 --> 01:06:05.998 Thanks again from apartment.