WEBVTT

NOTE duration:"00:58:17"

NOTE recognizability:0.876

NOTE language:en-us

NOTE Confidence: 0.7208154

00:00:00.000 --> 00:00:00.600 Spring.

NOTE Confidence: 0.921104202

00:00:04.610 --> 00:00:05.810 We have a few announcements,

NOTE Confidence: 0.921104202

00:00:05.810 --> 00:00:08.590 upcoming grand rounds next week,

NOTE Confidence: 0.921104202

00:00:08.590 --> 00:00:11.356 March 30th is one of our.

NOTE Confidence: 0.921104202

00:00:11.360 --> 00:00:13.865 A special lecturers named lecture

NOTE Confidence: 0.921104202

00:00:13.865 --> 00:00:17.040 and part of our Centennial series,

NOTE Confidence: 0.921104202

00:00:17.040 --> 00:00:18.666 the C DAF Cook Lectureship.

NOTE Confidence: 0.921104202

00:00:18.666 --> 00:00:21.078 Those of you who don't remember

NOTE Confidence: 0.921104202

00:00:21.078 --> 00:00:23.685 that Cook was a former chair of

NOTE Confidence: 0.921104202

00:00:23.685 --> 00:00:26.680 the Department of Pediatrics.

NOTE Confidence: 0.921104202

00:00:26.680 --> 00:00:27.712 And Kinari Webb,

NOTE Confidence: 0.921104202

00:00:27.712 --> 00:00:29.432 who's in family medicine and

NOTE Confidence: 0.921104202

00:00:29.432 --> 00:00:31.360 founder of health and harmony,

NOTE Confidence: 0.921104202

00:00:31.360 --> 00:00:33.480 will be speaking on healing

NOTE Confidence: 0.921104202

00:00:33.480 --> 00:00:35.600 the planet by recognizing the

NOTE Confidence: 0.921104202

00:00:35.679 --> 00:00:38.359 fundamental sickness of colonialism.

NOTE Confidence: 0.921104202

00:00:38.360 --> 00:00:39.760 Uh.

NOTE Confidence: 0.921104202

00:00:39.760 --> 00:00:41.770 Then on April 6th we're going

NOTE Confidence: 0.921104202

00:00:41.770 --> 00:00:43.260 to be having care rounds,

NOTE Confidence: 0.921104202

00:00:43.260 --> 00:00:45.986 which are conversations and

NOTE Confidence: 0.921104202

00:00:45.986 --> 00:00:48.434 reflections experiences in the

NOTE Confidence: 0.921104202

00:00:48.434 --> 00:00:51.164 Children's Hospital and look forward

NOTE Confidence: 0.921104202

00:00:51.164 --> 00:00:53.399 to that interactive grand rounds.

NOTE Confidence: 0.7674788

00:00:56.670 --> 00:00:59.180 Another announcement coming up on

NOTE Confidence: 0.7674788

00:00:59.180 --> 00:01:01.690 this Monday or monthly pediatric

NOTE Confidence: 0.7674788

00:01:01.772 --> 00:01:03.257 educational learning community

NOTE Confidence: 0.7674788

00:01:03.257 --> 00:01:06.227 series will be led by Galloping

NOTE Confidence: 0.7674788

00:01:06.227 --> 00:01:08.550 Me Soma and Gunjan Tiagra,

NOTE Confidence: 0.7674788

00:01:08.550 --> 00:01:10.794 both from the section of emergency

NOTE Confidence: 0.7674788

00:01:10.794 --> 00:01:12.290 medicine on introduction to

NOTE Confidence: 0.7674788

00:01:12.351 --> 00:01:14.100 qualitative research methods,

NOTE Confidence: 0.7674788

00:01:14.100 --> 00:01:15.808 exploring factors that influence

NOTE Confidence: 0.7674788

00:01:15.808 --> 00:01:17.943 the choice of academic pediatricians

NOTE Confidence: 0.7674788

00:01:17.943 --> 00:01:20.099 by underrepresented minorities.

NOTE Confidence: 0.82551742

00:01:25.340 --> 00:01:26.816 And also Joe reminder.

NOTE Confidence: 0.82551742

00:01:26.816 --> 00:01:28.661 Another one of our major

NOTE Confidence: 0.82551742

00:01:28.661 --> 00:01:30.270 events for a Centennial.

NOTE Confidence: 0.82551742

00:01:30.270 --> 00:01:32.610 Is the Richard Ehrenkrantz Neonatology

NOTE Confidence: 0.82551742

00:01:32.610 --> 00:01:34.950 Symposium and this year's topic

NOTE Confidence: 0.82551742

00:01:35.022 --> 00:01:37.227 is ethical issues in neonatology?

NOTE Confidence: 0.82551742

00:01:37.230 --> 00:01:40.036 This will be taking place virtually Tuesday,

NOTE Confidence: 0.82551742

00:01:40.036 --> 00:01:44.128 April 5th from 1:00 to 5:30.

NOTE Confidence: 0.82551742

00:01:44.130 --> 00:01:46.905 There will be a incredible

NOTE Confidence: 0.82551742

00:01:46.905 --> 00:01:49.522 lineup of speakers and talking

NOTE Confidence: 0.82551742

00:01:49.522 --> 00:01:51.902 about these important topics in

NOTE Confidence: 0.82551742

00:01:51.902 --> 00:01:54.350 ethics related to neonatology,

NOTE Confidence: 0.82551742

00:01:54.350 --> 00:01:55.418 so please join us.

NOTE Confidence: 0.760267842

00:01:59.340 --> 00:02:01.888 There are no conflicts and no contact,

NOTE Confidence: 0.760267842

00:02:01.890 --> 00:02:04.025 no disclosures that need to be made.

NOTE Confidence: 0.766402963333333

00:02:06.310 --> 00:02:08.668 This is accredited for see me

NOTE Confidence: 0.766402963333333

00:02:08.670 --> 00:02:10.728 by the Yale School of Medicine.

NOTE Confidence: 0.766402963333333

00:02:10.730 --> 00:02:12.122 There's the number.

NOTE Confidence: 0.766402963333333

00:02:12.122 --> 00:02:14.906 The text to the CME office

NOTE Confidence: 0.766402963333333

00:02:14.910 --> 00:02:17.794 and will also put this in the

NOTE Confidence: 0.766402963333333

00:02:17.794 --> 00:02:19.670 zoom chat at various intervals

NOTE Confidence: 0.766402963333333

00:02:19.670 --> 00:02:21.070 throughout the grand rounds.

NOTE Confidence: 0.953836716

00:02:25.470 --> 00:02:27.618 And with that I'm going to

NOTE Confidence: 0.953836716

00:02:27.618 --> 00:02:30.280 turn it over to Mark Mercurio,

NOTE Confidence: 0.953836716

00:02:30.280 --> 00:02:32.740 to introduce today's speaker.

NOTE Confidence: 0.900185724285714

00:02:38.270 --> 00:02:39.089 Thank you Cliff.

NOTE Confidence: 0.900185724285714

00:02:39.089 --> 00:02:40.727 It's an honor to introduce my

NOTE Confidence: 0.900185724285714

00:02:40.727 --> 00:02:42.387 friend and colleague Jeff Grouin.

NOTE Confidence: 0.900185724285714

00:02:42.390 --> 00:02:44.250 Today I'm gonna just share my

NOTE Confidence: 0.900185724285714

00:02:44.250 --> 00:02:46.258 screen for a moment if I could.

NOTE Confidence: 0.8568894

00:02:49.240 --> 00:02:51.762 Let's go with this and share and

NOTE Confidence: 0.8568894

00:02:51.762 --> 00:02:54.156 are you looking at my slides now?

NOTE Confidence: 0.8568894

00:02:54.160 --> 00:02:57.171 So this this of course is doctor Jeff Broin

NOTE Confidence: 0.8568894

00:02:57.171 --> 00:02:59.444 who is known to you all as a professor

NOTE Confidence: 0.8568894

00:02:59.444 --> 00:03:01.140 of Pediatrics and genetics here at Yale.

NOTE Confidence: 0.8568894

00:03:01.140 --> 00:03:04.900 He's certainly one of the pillars of of

NOTE Confidence: 0.8568894

00:03:04.900 --> 00:03:07.520 Yale and neonatology, Yale Pediatrics,

NOTE Confidence: 0.8568894

00:03:07.520 --> 00:03:10.019 and Yale Science, but of course he

NOTE Confidence: 0.8568894

00:03:10.019 --> 00:03:12.630 didn't start out as such a big cheese.

NOTE Confidence: 0.8568894

00:03:12.630 --> 00:03:15.843 He was got his BS and MD at Tulane,

NOTE Confidence: 0.8568894

00:03:15.850 --> 00:03:18.234 came to Yale where he did his residency

NOTE Confidence: 0.8568894

00:03:18.234 --> 00:03:20.455 and fellowship and Jeff and I traveled

NOTE Confidence: 0.8568894

00:03:20.455 --> 00:03:22.025 this journey together ever since.

NOTE Confidence: 0.8568894

00:03:22.030 --> 00:03:23.962 And so it's been my absolute pleasure

NOTE Confidence: 0.8568894

00:03:23.962 --> 00:03:25.964 to watch him rise through the ranks.

NOTE Confidence: 0.8568894

00:03:25.970 --> 00:03:28.662 So let's see if we can get this slide

NOTE Confidence: 0.8568894

00:03:28.662 --> 00:03:31.068 to advance and apparently we can't.

NOTE Confidence: 0.8568894

00:03:31.070 --> 00:03:31.769 Let's try that.

NOTE Confidence: 0.8568894

00:03:31.769 --> 00:03:33.682 So here we go back a little bit

NOTE Confidence: 0.8568894

00:03:33.682 --> 00:03:35.243 in time and we see this here.

NOTE Confidence: 0.8568894

00:03:35.250 --> 00:03:36.402 I don't know if you can see my cursor.

NOTE Confidence: 0.8568894

00:03:36.410 --> 00:03:37.460 We see the second from the left.

NOTE Confidence: 0.8568894

00:03:37.460 --> 00:03:39.870 Standing up is a young Jeff grew in with his

NOTE Confidence: 0.8568894

00:03:39.927 --> 00:03:42.223 dog with his wife Susan here and Michelle.

NOTE Confidence: 0.8568894

00:03:42.230 --> 00:03:42.788 I see everybody.

NOTE Confidence: 0.8568894

00:03:42.788 --> 00:03:44.090 We had a lot of babies were

NOTE Confidence: 0.8568894

00:03:44.139 --> 00:03:45.369 born in Pediatrics that year.

NOTE Confidence: 0.8568894

00:03:45.370 --> 00:03:47.232 This, I think would be the spring

NOTE Confidence: 0.8568894

00:03:47.232 --> 00:03:49.498 of 85 in my backyard in Hamden.

NOTE Confidence: 0.8568894

00:03:49.500 --> 00:03:51.204 This is a young Luciano Pavarotti

NOTE Confidence: 0.8568894

00:03:51.204 --> 00:03:53.070 you see over here at the time.

NOTE Confidence: 0.8568894

00:03:53.070 --> 00:03:56.007 And this is and and again, Michelle.

NOTE Confidence: 0.8568894

00:03:56.007 --> 00:03:58.226 Jeff's daughter was not in this picture,

NOTE Confidence: 0.8568894

00:03:58.230 --> 00:04:00.456 but I've had the the pleasure

NOTE Confidence: 0.8568894

00:04:00.456 --> 00:04:01.940 of watching Doctor Gruen.

NOTE Confidence: 0.8568894

00:04:01.940 --> 00:04:03.984 Just rise through the ranks over the

NOTE Confidence: 0.8568894

00:04:03.984 --> 00:04:06.849 years and grow gradually to be the the

NOTE Confidence: 0.8568894

00:04:06.849 --> 00:04:09.867 fellow that you all know and love today.

NOTE Confidence: 0.8568894

00:04:09.870 --> 00:04:11.970 He became a professor of medicine.

NOTE Confidence: 0.8568894

00:04:11.970 --> 00:04:13.110 Excuse me of Pediatrics.

NOTE Confidence: 0.8568894

00:04:13.110 --> 00:04:16.126 In Unix in 2010 he's also an

NOTE Confidence: 0.8568894

00:04:16.126 --> 00:04:18.282 honorary professor at Shenzhen

NOTE Confidence: 0.8568894

00:04:18.282 --> 00:04:20.209 Tong University in China.

NOTE Confidence: 0.8568894

00:04:20.210 --> 00:04:22.310 He's internationally recognized as a

NOTE Confidence: 0.8568894

00:04:22.310 --> 00:04:24.410 scholar and investigator with collaborators

NOTE Confidence: 0.8568894

00:04:24.464 --> 00:04:26.666 around the collaborators around the world.

NOTE Confidence: 0.8568894

00:04:26.670 --> 00:04:28.710 He's very, very well published.

NOTE Confidence: 0.8568894

00:04:28.710 --> 00:04:30.018 He's been very well funded for

NOTE Confidence: 0.8568894

00:04:30.018 --> 00:04:31.223 a number of years, many,

NOTE Confidence: 0.8568894

00:04:31.223 --> 00:04:32.888 many years, and at Yale,

NOTE Confidence: 0.8568894

00:04:32.890 --> 00:04:35.620 he's really a valued mentor and advisor

NOTE Confidence: 0.8568894

00:04:35.620 --> 00:04:38.249 to medical students to graduate students,

NOTE Confidence: 0.8568894

00:04:38.250 --> 00:04:40.210 to, to our trainees, to our junior.

NOTE Confidence: 0.8568894

00:04:40.210 --> 00:04:41.710 Faculty and, and frankly,

NOTE Confidence: 0.8568894

00:04:41.710 --> 00:04:44.725 to at least one very grateful Chief for

NOTE Confidence: 0.8568894

00:04:44.725 --> 00:04:47.501 whom he's been a valued advisor for many,

NOTE Confidence: 0.8568894

00:04:47.510 --> 00:04:48.118 many years.

NOTE Confidence: 0.8568894

00:04:48.118 --> 00:04:50.550 So it's been my pleasure to watch Jeff

NOTE Confidence: 0.8568894

00:04:50.550 --> 00:04:53.370 really become such an incredibly,

NOTE Confidence: 0.8568894

00:04:53.370 --> 00:04:54.798 highly respected scholar and

NOTE Confidence: 0.8568894

00:04:54.798 --> 00:04:56.226 investigator that he is.

NOTE Confidence: 0.8568894

00:04:56.230 --> 00:04:56.818 You know,

NOTE Confidence: 0.8568894

00:04:56.818 --> 00:04:58.288 he studies genetic variants that

NOTE Confidence: 0.8568894

00:04:58.288 --> 00:04:59.790 underlie common learning disabilities,

NOTE Confidence: 0.8568894

00:04:59.790 --> 00:05:01.316 and you're going to hear a bit

NOTE Confidence: 0.8568894

00:05:01.316 --> 00:05:01.970 about that today.

NOTE Confidence: 0.8568894

00:05:01.970 --> 00:05:02.675 And as such,

NOTE Confidence: 0.8568894

00:05:02.675 --> 00:05:04.320 the talk should really be of interest

NOTE Confidence: 0.8568894

00:05:04.371 --> 00:05:05.826 to anybody who's interested in

NOTE Confidence: 0.8568894

00:05:05.826 --> 00:05:07.281 genetics or studies genetics or

NOTE Confidence: 0.8568894

00:05:07.337 --> 00:05:08.884 who wants to learn more about it,

NOTE Confidence: 0.8568894

00:05:08.890 --> 00:05:11.014 or anybody who's who works with

NOTE Confidence: 0.8568894

00:05:11.014 --> 00:05:12.768 kids with learning disabilities or

NOTE Confidence: 0.8568894

00:05:12.768 --> 00:05:14.406 wants to learn more about that.

NOTE Confidence: 0.8568894

00:05:14.410 --> 00:05:15.916 But there's the lecture will also

NOTE Confidence: 0.8568894

00:05:15.916 --> 00:05:17.735 be of interest to anybody who wants

NOTE Confidence: 0.8568894

00:05:17.735 --> 00:05:19.000 to be a better teacher,

NOTE Confidence: 0.8568894

00:05:19.000 --> 00:05:20.800 because as most of you know,

NOTE Confidence: 0.8568894

00:05:20.800 --> 00:05:21.500 and many of you know,

NOTE Confidence: 0.8568894

00:05:21.500 --> 00:05:23.838 and you're all about to find out,

NOTE Confidence: 0.8568894

00:05:23.840 --> 00:05:25.640 our friend Jeff can teach.

NOTE Confidence: 0.8568894

00:05:25.640 --> 00:05:27.270 He can take difficult subjects

NOTE Confidence: 0.8568894

00:05:27.270 --> 00:05:28.900 and make them accessible to

NOTE Confidence: 0.863640104736842

00:05:28.957 --> 00:05:31.549 to the point where even a bioethicist can

NOTE Confidence: 0.863640104736842

00:05:31.549 --> 00:05:33.950 understand he's an extremely gifted teacher,

NOTE Confidence: 0.863640104736842

00:05:33.950 --> 00:05:35.120 and he's also, by the way,

NOTE Confidence: 0.863640104736842

00:05:35.120 --> 00:05:36.644 a very gifted neonatologist.

NOTE Confidence: 0.863640104736842

00:05:36.644 --> 00:05:38.930 He is the triple threat that

NOTE Confidence: 0.863640104736842

00:05:38.998 --> 00:05:41.068 people talk about on academics,

NOTE Confidence: 0.863640104736842

00:05:41.070 --> 00:05:42.380 and it's really been my

NOTE Confidence: 0.863640104736842

00:05:42.380 --> 00:05:43.428 pleasure and honor to.

NOTE Confidence: 0.863640104736842

00:05:43.430 --> 00:05:45.086 Have this journey with Jeff for

NOTE Confidence: 0.863640104736842

00:05:45.086 --> 00:05:46.190 the last many years.

NOTE Confidence: 0.863640104736842

00:05:46.190 --> 00:05:47.177 As you can see from that picture,

NOTE Confidence: 0.863640104736842

00:05:47.180 --> 00:05:49.084 you know I think Cliff is still celebrating.

NOTE Confidence: 0.863640104736842

00:05:49.090 --> 00:05:51.250 We're all still celebrating 100 years

NOTE Confidence: 0.863640104736842

00:05:51.250 --> 00:05:53.806 of Yale Pediatrics and so and so they

NOTE Confidence: 0.863640104736842

00:05:53.806 --> 00:05:55.780 wanted a couple of guys today who

NOTE Confidence: 0.863640104736842

00:05:55.780 --> 00:05:58.090 actually were here 100 years ago at

NOTE Confidence: 0.863640104736842

00:05:58.090 --> 00:06:01.170 Yale Pediatrics and so here we are.

NOTE Confidence: 0.863640104736842

00:06:01.170 --> 00:06:02.430 It's an absolute pleasure

NOTE Confidence: 0.863640104736842

00:06:02.430 --> 00:06:03.690 to introduce my friend,

NOTE Confidence: 0.863640104736842

00:06:03.690 --> 00:06:04.360 Jeff Gruen.

NOTE Confidence: 0.811512863333333

00:06:14.170 --> 00:06:17.994 You know if you ever want an emotional

NOTE Confidence: 0.811512863333333

00:06:17.994 --> 00:06:20.032 experience, be introduced by somebody

NOTE Confidence: 0.811512863333333

00:06:20.032 --> 00:06:21.972 who's been really your friend,

NOTE Confidence: 0.811512863333333

00:06:21.980 --> 00:06:25.970 not just a colleague for 35 years, it's.

NOTE Confidence: 0.811512863333333

00:06:25.970 --> 00:06:27.475 You can really get choked up about

NOTE Confidence: 0.811512863333333

00:06:27.475 --> 00:06:28.760 this stuff. Thank you for doing that.

NOTE Confidence: 0.811512863333333

00:06:28.760 --> 00:06:30.144 Right before I have to give a talk,

NOTE Confidence: 0.811512863333333

00:06:30.150 --> 00:06:32.080 I really appreciate that Mark. Thank you.

NOTE Confidence: 0.8968122175

00:06:33.690 --> 00:06:35.740 Glad to help, Jeff, thank you.

NOTE Confidence: 0.940617793333333

00:06:38.180 --> 00:06:40.385 So I'm going to talk a little

NOTE Confidence: 0.940617793333333

00:06:40.385 --> 00:06:42.662 bit about our new program for

NOTE Confidence: 0.940617793333333

00:06:42.662 --> 00:06:43.988 learning disabilities research.

NOTE Confidence: 0.940617793333333

00:06:43.988 --> 00:06:46.640 I'm going to basically answer the

NOTE Confidence: 0.940617793333333

00:06:46.705 --> 00:06:49.010 five basic questions, why, what,

NOTE Confidence: 0.940617793333333

00:06:49.010 --> 00:06:51.890 how, where and who very simply.

NOTE Confidence: 0.940617793333333

00:06:51.890 --> 00:06:54.175 Why is early identification of

NOTE Confidence: 0.940617793333333

00:06:54.175 --> 00:06:55.546 learning disabilities important?

NOTE Confidence: 0.940617793333333

00:06:55.550 --> 00:06:57.447 What is the scope of the problem?

NOTE Confidence: 0.940617793333333

00:06:57.450 --> 00:07:00.600 How will early identification disrupt and

NOTE Confidence: 0.940617793333333

00:07:00.600 --> 00:07:03.430 change the current educational paradigm?

NOTE Confidence: 0.940617793333333

00:07:03.430 --> 00:07:05.374 Where can we make a difference

NOTE Confidence: 0.940617793333333

00:07:05.374 --> 00:07:06.670 and who are we?

NOTE Confidence: 0.940617793333333

00:07:06.670 --> 00:07:10.238 So let's get started and with all our

NOTE Confidence: 0.940617793333333

00:07:10.238 --> 00:07:12.310 research we start in the classroom.

NOTE Confidence: 0.940617793333333

00:07:12.310 --> 00:07:14.166 And that's because worldwide,

NOTE Confidence: 0.940617793333333

00:07:14.166 --> 00:07:16.418 about 15% of students everywhere

NOTE Confidence: 0.940617793333333

00:07:16.418 --> 00:07:18.206 struggle with learning disabilities.

NOTE Confidence: 0.940617793333333

00:07:18.210 --> 00:07:19.694 These include things you've

NOTE Confidence: 0.940617793333333

00:07:19.694 --> 00:07:21.920 heard of and things you haven't.

NOTE Confidence: 0.940617793333333

00:07:21.920 --> 00:07:23.704 Most common is dyslexia,

NOTE Confidence: 0.940617793333333

00:07:23.704 --> 00:07:25.934 also known as reading disability,

NOTE Confidence: 0.940617793333333

00:07:25.940 --> 00:07:27.293 specific language impairment,

NOTE Confidence: 0.940617793333333

00:07:27.293 --> 00:07:29.999 which is delayed onset of speech,

NOTE Confidence: 0.940617793333333

00:07:30.000 --> 00:07:31.341 verbal trait disorder,

NOTE Confidence: 0.940617793333333

00:07:31.341 --> 00:07:33.576 which is impairment of articulation,

NOTE Confidence: 0.940617793333333

00:07:33.580 --> 00:07:34.174 dyscalculia,

NOTE Confidence: 0.940617793333333

00:07:34.174 --> 00:07:37.738 a math disability and attention disorder,

NOTE Confidence: 0.940617793333333

00:07:37.740 --> 00:07:39.078 is better known to most folks.

NOTE Confidence: 0.940617793333333

00:07:39.080 --> 00:07:41.600 Is ADHD and ADD dot.

NOTE Confidence: 0.940617793333333

00:07:41.600 --> 00:07:42.935 But what I'm talking about

NOTE Confidence: 0.940617793333333

00:07:42.935 --> 00:07:44.908 today and every and all the kids

NOTE Confidence: 0.940617793333333

00:07:44.908 --> 00:07:46.358 that I'll be talking studies,

NOTE Confidence: 0.940617793333333

00:07:46.360 --> 00:07:49.433 I'll be talking about today are students

NOTE Confidence: 0.940617793333333

00:07:49.433 --> 00:07:52.249 in regular classes at regular schools.

NOTE Confidence: 0.940617793333333

00:07:52.250 --> 00:07:56.058 And with normal or above normal intelligence.

NOTE Confidence: 0.940617793333333

00:07:56.060 --> 00:07:57.960 For most children, a durable

NOTE Confidence: 0.940617793333333

00:07:57.960 --> 00:08:00.660 intervention can make a huge difference,

NOTE Confidence: 0.940617793333333

00:08:00.660 --> 00:08:02.305 and I'm going to show you that

NOTE Confidence: 0.940617793333333

00:08:02.305 --> 00:08:04.078 data in a in a few minutes,

NOTE Confidence: 0.940617793333333

00:08:04.080 --> 00:08:06.383 but in the meantime there are three

NOTE Confidence: 0.940617793333333

00:08:06.383 --> 00:08:08.600 critical things to know about reading.

NOTE Confidence: 0.940617793333333

00:08:08.600 --> 00:08:11.258 The first is that dyslexia or

NOTE Confidence: 0.940617793333333

00:08:11.258 --> 00:08:13.650 reading disability is really common,

NOTE Confidence: 0.940617793333333

00:08:13.650 --> 00:08:16.149 so if I take the 2000 fourth

NOTE Confidence: 0.940617793333333

00:08:16.149 --> 00:08:18.119 graders here in New Haven,

NOTE Confidence: 0.940617793333333

00:08:18.120 --> 00:08:19.152 and I take them,

NOTE Confidence: 0.940617793333333

00:08:19.152 --> 00:08:20.442 I give them any standardized

NOTE Confidence: 0.940617793333333

00:08:20.442 --> 00:08:21.879 reading performance assessment.

NOTE Confidence: 0.940617793333333

00:08:21.880 --> 00:08:24.405 Let's say comprehension or single

NOTE Confidence: 0.940617793333333

00:08:24.405 --> 00:08:26.026 word reading, and we.

NOTE Confidence: 0.940617793333333

00:08:26.026 --> 00:08:27.844 We graph them the number of

NOTE Confidence: 0.940617793333333

00:08:27.844 --> 00:08:29.240 readers at each point,

NOTE Confidence: 0.940617793333333

00:08:29.240 --> 00:08:31.040 low scoring versus high scoring.

NOTE Confidence: 0.940617793333333

00:08:31.040 --> 00:08:31.734 Not surprisingly,

NOTE Confidence: 0.940617793333333

00:08:31.734 --> 00:08:33.469 you'll get a normal distribution

NOTE Confidence: 0.940617793333333

00:08:33.469 --> 00:08:35.474 if you have enough students with

NOTE Confidence: 0.940617793333333

00:08:35.474 --> 00:08:37.515 a mean and what we call reading

NOTE Confidence: 0.940617793333333

00:08:37.515 --> 00:08:39.220 disability is basically a cut off.

NOTE Confidence: 0.940617793333333

00:08:39.220 --> 00:08:40.636 It's a cut off at the tail end.

NOTE Confidence: 0.940617793333333

00:08:40.640 --> 00:08:41.900 It's a lower end,

NOTE Confidence: 0.940617793333333

00:08:41.900 --> 00:08:44.959 so most places do around the 10th percentile.

NOTE Confidence: 0.940617793333333

00:08:44.960 --> 00:08:47.816 Some places do 15, some do 12 percentile.

NOTE Confidence: 0.940617793333333

00:08:47.820 --> 00:08:49.969 But in the United States we're talking

NOTE Confidence: 0.940617793333333

00:08:49.969 --> 00:08:52.779 about 5 to 10 million US schoolchildren.

NOTE Confidence: 0.940617793333333

00:08:52.780 --> 00:08:54.418 Again, these are in regular kids.

NOTE Confidence: 0.940617793333333

00:08:54.420 --> 00:08:57.577 These are regular kids in regular schools.

NOTE Confidence: 0.940617793333333

00:08:57.580 --> 00:08:59.560 The second thing to know is

NOTE Confidence: 0.940617793333333

00:08:59.560 --> 00:09:01.438 that it's genetic, and so again,

NOTE Confidence: 0.940617793333333

00:09:01.438 --> 00:09:03.510 if we take our distribution of children,

NOTE Confidence: 0.940617793333333

00:09:03.510 --> 00:09:06.230 let's say again 4th graders and we do

NOTE Confidence: 0.940617793333333

00:09:06.230 --> 00:09:08.088 say comprehension and we chart them.

NOTE Confidence: 0.940617793333333

00:09:08.090 --> 00:09:09.866 So we have a normal distribution.

NOTE Confidence: 0.940617793333333

00:09:09.870 --> 00:09:11.284 Not only will it have a mean,

NOTE Confidence: 0.940617793333333

00:09:11.290 --> 00:09:12.934 but it'll be a variance around

NOTE Confidence: 0.940617793333333

00:09:12.934 --> 00:09:14.030 the mean as well.

NOTE Confidence: 0.940617793333333

00:09:14.030 --> 00:09:15.410 And if we ask the factors,

NOTE Confidence: 0.940617793333333

00:09:15.410 --> 00:09:18.315 ask which factors can account for that

NOTE Confidence: 0.940617793333333

00:09:18.315 --> 00:09:21.310 variance and in fact non genetic factors.

NOTE Confidence: 0.940617793333333

00:09:21.310 --> 00:09:23.291 To the surprise of most people actually

NOTE Confidence: 0.940617793333333

00:09:23.291 --> 00:09:25.209 account for a very small percent,

NOTE Confidence: 0.940617793333333

00:09:25.210 --> 00:09:27.381 probably in the 20 to 30% range.

NOTE Confidence: 0.940617793333333

00:09:27.381 --> 00:09:29.105 Ras cumulative genetic factors

NOTE Confidence: 0.940617793333333

00:09:29.105 --> 00:09:31.717 account for the vast majority of

NOTE Confidence: 0.940617793333333

00:09:31.717 --> 00:09:33.647 reading performance or the variance

NOTE Confidence: 0.940617793333333

00:09:33.647 --> 00:09:35.842 around the mean for all of us,

NOTE Confidence: 0.940617793333333

00:09:35.842 --> 00:09:37.390 and that's why it's really important

NOTE Confidence: 0.940617793333333

00:09:37.448 --> 00:09:38.968 to pick our parents carefully,

NOTE Confidence: 0.940617793333333

00:09:38.970 --> 00:09:40.800 because this is what really is

NOTE Confidence: 0.940617793333333

00:09:40.800 --> 00:09:42.020 important for our performance

NOTE Confidence: 0.925943195

00:09:42.071 --> 00:09:42.629 in reading.

NOTE Confidence: 0.942632043846154

00:09:44.670 --> 00:09:46.974 So what we say is that genetic factors

NOTE Confidence: 0.942632043846154

00:09:46.974 --> 00:09:49.543 account for up to 80% of reading performance,

NOTE Confidence: 0.942632043846154

00:09:49.543 --> 00:09:52.369 and we call this concept heritability.

NOTE Confidence: 0.942632043846154

00:09:52.370 --> 00:09:55.100 And since genetic factors are mostly

NOTE Confidence: 0.942632043846154

00:09:55.100 --> 00:09:57.415 responsible for dyslexia and our

NOTE Confidence: 0.942632043846154

00:09:57.415 --> 00:09:59.515 performance and meeting our past

NOTE Confidence: 0.942632043846154

00:09:59.515 --> 00:10:01.690 was to discover reading genes.

NOTE Confidence: 0.942632043846154

00:10:01.690 --> 00:10:04.203 And so to identify these kids at

NOTE Confidence: 0.942632043846154

00:10:04.203 --> 00:10:06.069 risk when intervention works best,

NOTE Confidence: 0.942632043846154

00:10:06.070 --> 00:10:08.506 we developed a genetic screening panel.

NOTE Confidence: 0.942632043846154

00:10:08.510 --> 00:10:10.770 We collect saliva from saliva.

NOTE Confidence: 0.942632043846154

00:10:10.770 --> 00:10:12.858 We extract genomic DNA and we've

NOTE Confidence: 0.942632043846154

00:10:12.858 --> 00:10:14.970 done these studies in two forms.

NOTE Confidence: 0.942632043846154

00:10:14.970 --> 00:10:17.106 Our first one was about 10 years ago.

NOTE Confidence: 0.942632043846154

00:10:17.110 --> 00:10:18.685 Was the grad study of the genes

NOTE Confidence: 0.942632043846154

00:10:18.685 --> 00:10:19.670 reading and dyslexia study.

NOTE Confidence: 0.942632043846154

00:10:19.670 --> 00:10:22.078 The first study of its kind of a

NOTE Confidence: 0.942632043846154

00:10:22.078 --> 00:10:23.564 strictly African American Hispanic

NOTE Confidence: 0.942632043846154

00:10:23.564 --> 00:10:26.030 American kids in the United States

NOTE Confidence: 0.942632043846154

00:10:26.030 --> 00:10:28.444 using genetics and then more recently

NOTE Confidence: 0.942632043846154

00:10:28.444 --> 00:10:29.968 the longitudinal program called

NOTE Confidence: 0.942632043846154

00:10:29.968 --> 00:10:31.891 the New Haven Lectionum project.

NOTE Confidence: 0.942632043846154

00:10:31.891 --> 00:10:34.600 And these have been informative for kids

NOTE Confidence: 0.942632043846154

00:10:34.665 --> 00:10:36.930 that are European American background,

NOTE Confidence: 0.942632043846154

00:10:36.930 --> 00:10:38.511 Hispanic American background

NOTE Confidence: 0.942632043846154

00:10:38.511 --> 00:10:40.619 and African American background.

NOTE Confidence: 0.942632043846154

00:10:40.620 --> 00:10:42.828 And we published these in in

NOTE Confidence: 0.942632043846154

00:10:42.828 --> 00:10:44.720 in in peer review journals.

NOTE Confidence: 0.942632043846154

00:10:44.720 --> 00:10:47.000 Some pretty high quality peer review

NOTE Confidence: 0.942632043846154

00:10:47.065 --> 00:10:49.505 journals and that in a very nice very

NOTE Confidence: 0.942632043846154

00:10:49.505 --> 00:10:52.222 nicely that many of them are reproduced

NOTE Confidence: 0.942632043846154

00:10:52.222 --> 00:10:53.854 sometimes in other populations,

NOTE Confidence: 0.942632043846154

00:10:53.860 --> 00:10:56.948 even in other languages.

NOTE Confidence: 0.942632043846154

00:10:56.950 --> 00:10:59.860 So the third thing to know

NOTE Confidence: 0.942632043846154

00:10:59.860 --> 00:11:01.800 about reading is that.

NOTE Confidence: 0.942632043846154

00:11:01.800 --> 00:11:04.397 Is that dyslexia can be effectively treated,

NOTE Confidence: 0.942632043846154

00:11:04.400 --> 00:11:06.560 and so let me share with you data

NOTE Confidence: 0.942632043846154

00:11:06.560 --> 00:11:09.145 from my colleague Maureen Lovett

NOTE Confidence: 0.942632043846154

00:11:09.145 --> 00:11:12.275 at the University of Toronto and

NOTE Confidence: 0.942632043846154

00:11:12.275 --> 00:11:14.535 State Kit and Maureen study.

NOTE Confidence: 0.942632043846154

00:11:14.540 --> 00:11:16.540 Does randomized control trials and

NOTE Confidence: 0.942632043846154

00:11:16.540 --> 00:11:19.280 kids who struggle with reading and she

NOTE Confidence: 0.942632043846154

00:11:19.280 --> 00:11:21.308 does a very intense intervention that

NOTE Confidence: 0.942632043846154

00:11:21.308 --> 00:11:23.894 lasts for about a year and what she's

NOTE Confidence: 0.942632043846154

00:11:23.894 --> 00:11:26.324 done is she's retested them two years

NOTE Confidence: 0.942632043846154

00:11:26.324 --> 00:11:28.314 after completion of the intervention.

NOTE Confidence: 0.942632043846154

00:11:28.320 --> 00:11:30.161 So these are outcomes 2 years after

NOTE Confidence: 0.942632043846154

00:11:30.161 --> 00:11:31.629 completion of an intervention for

NOTE Confidence: 0.942632043846154

00:11:31.629 --> 00:11:33.799 children that were picked up in grade.

NOTE Confidence: 0.942632043846154

00:11:33.800 --> 00:11:36.392 One children in grade two children

NOTE Confidence: 0.942632043846154

00:11:36.392 --> 00:11:37.908 in grade 3/4, etc.

NOTE Confidence: 0.942632043846154

00:11:37.908 --> 00:11:40.740 All the way out to grade 12 and what

NOTE Confidence: 0.942632043846154

00:11:40.740 --> 00:11:42.700 you can see here pretty obviously is

NOTE Confidence: 0.942632043846154

00:11:42.700 --> 00:11:44.683 that these are the kids that perform

NOTE Confidence: 0.942632043846154

00:11:44.683 --> 00:11:46.739 the best that are most responsive.

NOTE Confidence: 0.942632043846154

00:11:46.740 --> 00:11:49.519 So about 75% of these kids will

NOTE Confidence: 0.942632043846154

00:11:49.519 --> 00:11:51.873 respond to intervention and will be

NOTE Confidence: 0.942632043846154

00:11:51.873 --> 00:11:54.039 reading at grade level two years

NOTE Confidence: 0.942632043846154

00:11:54.039 --> 00:11:56.718 after completion of the intervention.

NOTE Confidence: 0.942632043846154

00:11:56.720 --> 00:11:57.329 Whereas in contrast,

NOTE Confidence: 0.942632043846154

00:11:57.329 --> 00:11:58.750 if you look at kids that are

NOTE Confidence: 0.942632043846154

00:11:58.800 --> 00:11:59.840 picked up in high school,

NOTE Confidence: 0.942632043846154

00:11:59.840 --> 00:12:02.225 which is about 50% or so of kids in

NOTE Confidence: 0.942632043846154

00:12:02.225 --> 00:12:04.458 the United States are picked up.

NOTE Confidence: 0.942632043846154

00:12:04.460 --> 00:12:06.686 Was reading disability in high school

NOTE Confidence: 0.942632043846154

00:12:06.686 --> 00:12:09.212 or later only about 1/4 of those

NOTE Confidence: 0.942632043846154

00:12:09.212 --> 00:12:11.162 kids will actually be respond will

NOTE Confidence: 0.942632043846154

00:12:11.162 --> 00:12:13.395 be reading it ever brought up to

NOTE Confidence: 0.942632043846154

00:12:13.395 --> 00:12:15.505 grade level or be reading at grade

NOTE Confidence: 0.942632043846154

00:12:15.505 --> 00:12:16.980 level even two years afterwards,

NOTE Confidence: 0.942632043846154

00:12:16.980 --> 00:12:18.864 so early identification is

NOTE Confidence: 0.942632043846154

00:12:18.864 --> 00:12:20.277 obviously really important.

NOTE Confidence: 0.942632043846154

00:12:20.280 --> 00:12:21.519 That's the key.

NOTE Confidence: 0.942632043846154

00:12:21.519 --> 00:12:23.584 The key to effective intervention

NOTE Confidence: 0.942632043846154

00:12:23.584 --> 00:12:25.560 is early identification,

NOTE Confidence: 0.942632043846154

00:12:25.560 --> 00:12:28.654 but the window of opportunity is narrow.

NOTE Confidence: 0.942632043846154

00:12:28.660 --> 00:12:30.520 So let me show you why.

NOTE Confidence: 0.942632043846154

00:12:30.520 --> 00:12:32.335 Here's our current approach in

NOTE Confidence: 0.942632043846154

00:12:32.335 --> 00:12:33.787 our educational system today,

NOTE Confidence: 0.942632043846154

00:12:33.790 --> 00:12:34.840 and that's in private schools,

NOTE Confidence: 0.942632043846154

00:12:34.840 --> 00:12:36.068 public schools everywhere we

NOTE Confidence: 0.942632043846154

00:12:36.068 --> 00:12:38.320 call it the wait to fail model.

NOTE Confidence: 0.942632043846154

00:12:38.320 --> 00:12:40.258 You'll be very familiar with this,

NOTE Confidence: 0.942632043846154

00:12:40.260 --> 00:12:42.340 and so this would be typical development of,

NOTE Confidence: 0.942632043846154

00:12:42.340 --> 00:12:42.864 say, comprehension.

NOTE Confidence: 0.942632043846154

00:12:42.864 --> 00:12:44.960 But again, it could be single word reading,

NOTE Confidence: 0.942632043846154

00:12:44.960 --> 00:12:47.342 could be spelling of kids of

NOTE Confidence: 0.942632043846154

00:12:47.342 --> 00:12:48.136 typical children,

NOTE Confidence: 0.890894845714286

00:12:48.140 --> 00:12:49.799 the United States and around the world.

NOTE Confidence: 0.890894845714286

00:12:49.800 --> 00:12:52.050 Frankly, in a pre K all the way up through

NOTE Confidence: 0.890894845714286

00:12:52.107 --> 00:12:54.355 grade five you can see it's nearly linear.

NOTE Confidence: 0.890894845714286

00:12:54.360 --> 00:12:56.370 The increase in the performance

NOTE Confidence: 0.890894845714286

00:12:56.370 --> 00:12:57.978 from year to year.

NOTE Confidence: 0.890894845714286

00:12:57.980 --> 00:13:00.514 But there are children who begin to

NOTE Confidence: 0.890894845714286

00:13:00.514 --> 00:13:03.284 fall off once they are come face to

NOTE Confidence: 0.890894845714286

00:13:03.284 --> 00:13:04.974 face with a challenging curriculum,

NOTE Confidence: 0.890894845714286

00:13:04.980 --> 00:13:06.015 so this will usually happen

NOTE Confidence: 0.890894845714286

00:13:06.015 --> 00:13:07.280 at the end of grade one,

NOTE Confidence: 0.890894845714286

00:13:07.280 --> 00:13:09.165 definitely in grade 2 where

NOTE Confidence: 0.890894845714286

00:13:09.165 --> 00:13:11.410 they really begin to fall off.

NOTE Confidence: 0.890894845714286

00:13:11.410 --> 00:13:12.410 In the current model,

NOTE Confidence: 0.890894845714286

00:13:12.410 --> 00:13:14.430 what we do is we wait until

NOTE Confidence: 0.890894845714286

00:13:14.430 --> 00:13:16.246 they're really performing poorly,

NOTE Confidence: 0.890894845714286

00:13:16.250 --> 00:13:18.308 and then we do a standard intervention.

NOTE Confidence: 0.890894845714286

00:13:18.310 --> 00:13:19.525 And even if the intervention

NOTE Confidence: 0.890894845714286

00:13:19.525 --> 00:13:21.053 is intense and even if they're

NOTE Confidence: 0.890894845714286

00:13:21.053 --> 00:13:22.607 young enough to respond to it,

NOTE Confidence: 0.890894845714286

00:13:22.610 --> 00:13:25.050 they never really catch up,

NOTE Confidence: 0.890894845714286

00:13:25.050 --> 00:13:28.098 and so this gap is never really bridged.

NOTE Confidence: 0.890894845714286

00:13:28.100 --> 00:13:30.375 What we're proposing is a different model.

NOTE Confidence: 0.890894845714286

00:13:30.380 --> 00:13:33.204 What we'd like to do is identify the

NOTE Confidence: 0.890894845714286

00:13:33.204 --> 00:13:35.324 kids here early and then track them,

NOTE Confidence: 0.890894845714286

00:13:35.324 --> 00:13:36.990 and then when they even fall off,

NOTE Confidence: 0.890894845714286

00:13:36.990 --> 00:13:39.940 or even even just mildly,

NOTE Confidence: 0.890894845714286

00:13:39.940 --> 00:13:42.915 then we can initiate an early intervention,

NOTE Confidence: 0.890894845714286

00:13:42.920 --> 00:13:44.840 and which they would catch up,

NOTE Confidence: 0.890894845714286

00:13:44.840 --> 00:13:46.472 or at least attain very nearly

NOTE Confidence: 0.890894845714286

00:13:46.472 --> 00:13:47.288 Gray level reading.

NOTE Confidence: 0.890894845714286

00:13:47.290 --> 00:13:49.440 And that is then sustainable.

NOTE Confidence: 0.890894845714286

00:13:49.440 --> 00:13:53.528 But the key here is the early identification.

NOTE Confidence: 0.890894845714286

00:13:53.530 --> 00:13:56.670 So in in order to do that, that's where.

NOTE Confidence: 0.890894845714286

00:13:56.670 --> 00:13:59.245 The the identification of genes,

NOTE Confidence: 0.890894845714286

00:13:59.250 --> 00:14:01.716 genetic variants and creation of a

NOTE Confidence: 0.890894845714286

00:14:01.716 --> 00:14:04.309 genetic screening panel is so important.

NOTE Confidence: 0.890894845714286

00:14:04.310 --> 00:14:05.348 So how do we do this?

NOTE Confidence: 0.890894845714286

00:14:05.350 --> 00:14:07.686 How do we do this magic of this

NOTE Confidence: 0.890894845714286

00:14:07.686 --> 00:14:08.270 early identification?

NOTE Confidence: 0.890894845714286

00:14:08.270 --> 00:14:10.406 And so as an example for a minute,

NOTE Confidence: 0.890894845714286

00:14:10.410 --> 00:14:11.901 let me just talk to you about

NOTE Confidence: 0.890894845714286

00:14:11.901 --> 00:14:13.641 some of the work we've been doing

NOTE Confidence: 0.890894845714286

00:14:13.641 --> 00:14:15.201 over the last seven years on

NOTE Confidence: 0.890894845714286

00:14:15.263 --> 00:14:16.878 the New Haven Leccinum project.

NOTE Confidence: 0.829816308666667

00:14:19.740 --> 00:14:21.940 You know, hey, the goal in New Haven

NOTE Confidence: 0.829816308666667

00:14:21.940 --> 00:14:23.705 election project has been to explore

NOTE Confidence: 0.829816308666667

00:14:23.705 --> 00:14:25.445 the extent to which genetic variants

NOTE Confidence: 0.829816308666667

00:14:25.505 --> 00:14:27.580 correspond with response to intervention

NOTE Confidence: 0.829816308666667

00:14:27.580 --> 00:14:29.655 through whole genome sequence analysis,

NOTE Confidence: 0.829816308666667

00:14:29.660 --> 00:14:32.132 serial behavioral testing and

NOTE Confidence: 0.829816308666667

00:14:32.132 --> 00:14:34.604 serial functional MRI studies.

NOTE Confidence: 0.829816308666667

00:14:34.610 --> 00:14:36.915 It's a longitudinal study of

NOTE Confidence: 0.829816308666667

00:14:36.915 --> 00:14:38.298 normally developing children.

NOTE Confidence: 0.829816308666667

00:14:38.300 --> 00:14:40.050 Grades we would enroll children

NOTE Confidence: 0.829816308666667

00:14:40.050 --> 00:14:42.196 in grades one and follow them

NOTE Confidence: 0.829816308666667

00:14:42.196 --> 00:14:44.176 all the way through grades five.

NOTE Confidence: 0.829816308666667

00:14:44.180 --> 00:14:45.800 We recruited these children from

NOTE Confidence: 0.829816308666667

00:14:45.800 --> 00:14:47.420 32 New Haven public schools.

NOTE Confidence: 0.829816308666667

00:14:47.420 --> 00:14:49.180 These are the regular schools,

NOTE Confidence: 0.829816308666667

00:14:49.180 --> 00:14:51.791 not the schools that have children with

NOTE Confidence: 0.829816308666667

00:14:51.791 --> 00:14:53.379 intellectually impaired children in them.

NOTE Confidence: 0.829816308666667

00:14:53.380 --> 00:14:55.235 We recruited about 500 and

NOTE Confidence: 0.829816308666667

00:14:55.235 --> 00:14:56.719 following about 500 children,

NOTE Confidence: 0.829816308666667

00:14:56.720 --> 00:14:58.885 these included a parent questionnaire

NOTE Confidence: 0.829816308666667

00:14:58.885 --> 00:15:02.506 based on for past medical history in depth

NOTE Confidence: 0.829816308666667

00:15:02.506 --> 00:15:04.298 questions about socioeconomic status,

NOTE Confidence: 0.829816308666667

00:15:04.300 --> 00:15:05.572 learning disability histories,

NOTE Confidence: 0.829816308666667

00:15:05.572 --> 00:15:09.026 primary language and spoken in the home, etc.

NOTE Confidence: 0.829816308666667

00:15:09.026 --> 00:15:12.913 And then for each child we did 30X

NOTE Confidence: 0.829816308666667

00:15:12.913 --> 00:15:15.328 whole genome sequencing through saliva.

NOTE Confidence: 0.871081869166667

00:15:17.910 --> 00:15:20.450 We also did standard psychometric

NOTE Confidence: 0.871081869166667

00:15:20.450 --> 00:15:22.482 batteries that assess reading

NOTE Confidence: 0.871081869166667

00:15:22.482 --> 00:15:24.410 language executive function.

NOTE Confidence: 0.871081869166667

00:15:24.410 --> 00:15:26.228 Beginning in grade one roughly every

NOTE Confidence: 0.871081869166667

00:15:26.228 --> 00:15:27.925 six months, all the way through Grade

NOTE Confidence: 0.871081869166667

00:15:27.925 --> 00:15:29.909 5 and the people who did the executive.

NOTE Confidence: 0.871081869166667

00:15:29.910 --> 00:15:32.003 These assessments were folks from our group

NOTE Confidence: 0.871081869166667

00:15:32.003 --> 00:15:34.146 and people who are trained to do this,

NOTE Confidence: 0.871081869166667

00:15:34.150 --> 00:15:36.488 so we didn't rely on school testing.

NOTE Confidence: 0.871081869166667

00:15:36.490 --> 00:15:37.882 It was our own group who

NOTE Confidence: 0.871081869166667

00:15:37.882 --> 00:15:38.810 actually did the testing,

NOTE Confidence: 0.871081869166667

00:15:38.810 --> 00:15:40.750 and we used standard batteries.

NOTE Confidence: 0.871081869166667

00:15:40.750 --> 00:15:42.686 So just for giving an example for those

NOTE Confidence: 0.871081869166667

00:15:42.686 --> 00:15:44.905 of you who are familiar with the field,

NOTE Confidence: 0.871081869166667

00:15:44.910 --> 00:15:46.690 these are standard neuro

NOTE Confidence: 0.871081869166667

00:15:46.690 --> 00:15:48.025 psychometric testing batteries.

NOTE Confidence: 0.871081869166667

00:15:48.030 --> 00:15:49.410 These are not batteries that we

NOTE Confidence: 0.871081869166667

00:15:49.410 --> 00:15:51.150 made up or tests that we made up.

NOTE Confidence: 0.871081869166667

00:15:51.150 --> 00:15:53.375 These were chosen by skilled

NOTE Confidence: 0.871081869166667

00:15:53.375 --> 00:15:55.600 neuropsychologists to be part of

NOTE Confidence: 0.871081869166667

00:15:55.675 --> 00:15:58.007 the educational assessment tool.

NOTE Confidence: 0.871081869166667

00:15:58.010 --> 00:16:00.146 They include the tower two or the test,

NOTE Confidence: 0.871081869166667

00:16:00.150 --> 00:16:01.870 averting reading efficiency subtests

NOTE Confidence: 0.871081869166667

00:16:01.870 --> 00:16:04.450 from the Woodcock Johnson and subtests

NOTE Confidence: 0.871081869166667

00:16:04.511 --> 00:16:06.287 from the Grey Oil reading test,

NOTE Confidence: 0.871081869166667

00:16:06.290 --> 00:16:07.965 and so we actually combined

NOTE Confidence: 0.871081869166667

00:16:07.965 --> 00:16:09.305 for the first study.

NOTE Confidence: 0.871081869166667

00:16:09.310 --> 00:16:13.666 I'm going to show you to this today is.

NOTE Confidence: 0.871081869166667

00:16:13.670 --> 00:16:16.334 It's what we call a composite of five

NOTE Confidence: 0.871081869166667

00:16:16.334 --> 00:16:18.830 subtests from these standardized testing,

NOTE Confidence: 0.871081869166667

00:16:18.830 --> 00:16:20.769 the first one is a sight word

NOTE Confidence: 0.871081869166667

00:16:20.769 --> 00:16:22.000 efficiency from the tower,

NOTE Confidence: 0.871081869166667

00:16:22.000 --> 00:16:25.208 where we ask children in a timed manner

NOTE Confidence: 0.871081869166667

00:16:25.210 --> 00:16:28.524 to read real words like cat, dog, etc.

NOTE Confidence: 0.871081869166667

00:16:28.524 --> 00:16:31.163 And then we score them for accuracy.

NOTE Confidence: 0.871081869166667

00:16:31.170 --> 00:16:33.389 They do it for about 45 seconds,

NOTE Confidence: 0.871081869166667

00:16:33.390 --> 00:16:35.136 so the next one is a

NOTE Confidence: 0.871081869166667

00:16:35.136 --> 00:16:36.009 phonemic decoding efficiency.

NOTE Confidence: 0.871081869166667

00:16:36.010 --> 00:16:37.970 It's called and so and so that

NOTE Confidence: 0.871081869166667

00:16:37.970 --> 00:16:39.429 memory doesn't play into this.

NOTE Confidence: 0.871081869166667

00:16:39.430 --> 00:16:41.170 We actually give them non words.

NOTE Confidence: 0.871081869166667

00:16:41.170 --> 00:16:42.334 Words like zoup.

NOTE Confidence: 0.871081869166667

00:16:42.334 --> 00:16:45.820 Again, it's timed and we score for accuracy.

NOTE Confidence: 0.871081869166667

00:16:45.820 --> 00:16:48.148 The letter word ID subtest Woodcock

NOTE Confidence: 0.871081869166667

00:16:48.148 --> 00:16:50.519 Johnson also looks at real words.

NOTE Confidence: 0.871081869166667

00:16:50.520 --> 00:16:51.885 It's not timed,

NOTE Confidence: 0.871081869166667

00:16:51.885 --> 00:16:54.160 but it's progressively more difficult,

NOTE Confidence: 0.871081869166667

00:16:54.160 --> 00:16:55.798 and here we score for accuracy.

NOTE Confidence: 0.871081869166667

00:16:55.800 --> 00:16:57.768 The number of words they accurately

NOTE Confidence: 0.871081869166667

00:16:57.768 --> 00:16:59.180 get and then the word attack,

NOTE Confidence: 0.871081869166667

00:16:59.180 --> 00:17:01.475 which is again back to non words again to

NOTE Confidence: 0.871081869166667

00:17:01.475 --> 00:17:04.055 to really look at their ability to decode.

NOTE Confidence: 0.871081869166667

00:17:04.060 --> 00:17:05.956 Also non timed and finally to

NOTE Confidence: 0.871081869166667

00:17:05.956 --> 00:17:08.023 look at reading fluency you have

NOTE Confidence: 0.871081869166667

00:17:08.023 --> 00:17:09.858 them read age appropriate passage.

NOTE Confidence: 0.871081869166667

00:17:09.860 --> 00:17:12.590 It's time we score for accuracy

NOTE Confidence: 0.871081869166667

00:17:12.590 --> 00:17:13.955 but also comprehension.

NOTE Confidence: 0.871081869166667

00:17:13.960 --> 00:17:16.468 So we combine these five subtests.

NOTE Confidence: 0.871081869166667

00:17:16.470 --> 00:17:18.930 Into a composite phenotype.

NOTE Confidence: 0.871081869166667

00:17:18.930 --> 00:17:21.392 And it's quantitative, that is.

NOTE Confidence: 0.871081869166667

00:17:21.392 --> 00:17:23.534 We could score it when we score

NOTE Confidence: 0.871081869166667

00:17:23.534 --> 00:17:24.770 it by a number,

NOTE Confidence: 0.871081869166667

00:17:24.770 --> 00:17:27.050 so we have high performers

NOTE Confidence: 0.871081869166667

00:17:27.050 --> 00:17:28.418 and low performers.

NOTE Confidence: 0.871081869166667

00:17:28.420 --> 00:17:30.618 And then the the trick here is

NOTE Confidence: 0.871081869166667

00:17:30.618 --> 00:17:33.016 to relate it to the genetics and

NOTE Confidence: 0.871081869166667

00:17:33.016 --> 00:17:35.751 we can do that using within the

NOTE Confidence: 0.871081869166667

00:17:35.751 --> 00:17:38.139 same children single nucleotide

NOTE Confidence: 0.871081869166667

00:17:38.139 --> 00:17:40.805 polymorphisms and just to re familiarize

NOTE Confidence: 0.871081869166667

00:17:40.805 --> 00:17:42.870 yourselves with what exactly a

NOTE Confidence: 0.871081869166667

00:17:42.951 --> 00:17:45.419 single nucleotide polymorphism is.

NOTE Confidence: 0.871081869166667

00:17:45.420 --> 00:17:48.924 I put up this little diagram that is

NOTE Confidence: 0.871081869166667

00:17:48.924 --> 00:17:51.582 diagramming a specific single nucleotide.

NOTE Confidence: 0.871081869166667

00:17:51.582 --> 00:17:54.558 Polymorphism has this horrific name called

NOTE Confidence: 0.915173408333333

00:17:57.880 --> 00:17:59.984 Rs 6935076. It's specifically

NOTE Confidence: 0.915173408333333

00:17:59.984 --> 00:18:03.140 located on chromosome 8 and its

NOTE Confidence: 0.915173408333333

00:18:03.231 --> 00:18:07.443 position is 24 million, 644,000,

NOTE Confidence: 0.915173408333333

00:18:07.443 --> 00:18:11.575 zero and 94 nucleotides from the top

NOTE Confidence: 0.915173408333333

00:18:11.575 --> 00:18:14.809 of the short arm of chromosome 8.

NOTE Confidence: 0.915173408333333

00:18:14.810 --> 00:18:16.665 And here you can see the sequence

NOTE Confidence: 0.915173408333333

00:18:16.665 --> 00:18:18.075 is very specific and because

NOTE Confidence: 0.915173408333333

00:18:18.075 --> 00:18:19.743 all of us carry 2 chromosomes,

NOTE Confidence: 0.915173408333333

00:18:19.750 --> 00:18:22.025 there are two representations of this area

NOTE Confidence: 0.915173408333333

00:18:22.025 --> 00:18:24.807 and of this specific position and person.

NOTE Confidence: 0.915173408333333

00:18:24.810 --> 00:18:27.281 One here is inherited from his mother

NOTE Confidence: 0.915173408333333

00:18:27.281 --> 00:18:30.249 ASI and from his father he's inherited.

NOTE Confidence: 0.915173408333333

00:18:30.250 --> 00:18:32.266 Also, I see and so we would say

NOTE Confidence: 0.915173408333333

00:18:32.266 --> 00:18:34.357 that for this snip at this point,

NOTE Confidence: 0.915173408333333

00:18:34.360 --> 00:18:37.252 which is which has a location

NOTE Confidence: 0.915173408333333

00:18:37.252 --> 00:18:39.180 specifically assigned to it,

NOTE Confidence: 0.915173408333333

00:18:39.180 --> 00:18:41.310 this person is homozygous for

NOTE Confidence: 0.915173408333333

00:18:41.310 --> 00:18:43.440 the C allele or CC.

NOTE Confidence: 0.915173408333333

00:18:43.440 --> 00:18:46.590 This person I a different person actually

NOTE Confidence: 0.915173408333333

00:18:46.590 --> 00:18:48.760 carries AT inherited from the mother

NOTE Confidence: 0.915173408333333

00:18:48.760 --> 00:18:51.000 and AT inherited from the father.

NOTE Confidence: 0.915173408333333

00:18:51.000 --> 00:18:53.940 So therefore this person would be homozygous

NOTE Confidence: 0.915173408333333

00:18:53.940 --> 00:18:57.340 for the teal or TT at this specific snip,

NOTE Confidence: 0.915173408333333

00:18:57.340 --> 00:18:59.755 and then finally we have the heterozygous

NOTE Confidence: 0.915173408333333

00:18:59.755 --> 00:19:01.838 individual who inherited AC from one parent.

NOTE Confidence: 0.915173408333333

00:19:01.840 --> 00:19:03.436 And a T from the other parent.

NOTE Confidence: 0.915173408333333

00:19:03.440 --> 00:19:06.194 So this person would be called the CT or

NOTE Confidence: 0.915173408333333

00:19:06.194 --> 00:19:08.915 the genotype would be a CT designating

NOTE Confidence: 0.915173408333333

00:19:08.915 --> 00:19:11.657 that that this person has one of each.

NOTE Confidence: 0.915173408333333

00:19:11.660 --> 00:19:13.256 So that's what a snip is.

NOTE Confidence: 0.915173408333333

00:19:13.260 --> 00:19:15.798 It's just a single nucleotide difference

NOTE Confidence: 0.915173408333333

00:19:15.798 --> 00:19:19.218 at a very specific location for everybody.

NOTE Confidence: 0.915173408333333

00:19:19.220 --> 00:19:21.831 So Rs.

NOTE Confidence: 0.915173408333333

00:19:21.831 --> 00:19:23.886 6935076 that specific location can

NOTE Confidence: 0.915173408333333

00:19:23.886 --> 00:19:26.854 be identified in all of us as well

NOTE Confidence: 0.915173408333333

00:19:26.854 --> 00:19:28.732 as our 500 children enrolled in

NOTE Confidence: 0.915173408333333

00:19:28.809 --> 00:19:30.899 New Haven election on project.

NOTE Confidence: 0.915173408333333

00:19:30.900 --> 00:19:33.396 So it does take a look at these

NOTE Confidence: 0.915173408333333

00:19:33.396 --> 00:19:35.634 three at these three genotypes.

NOTE Confidence: 0.915173408333333

00:19:35.634 --> 00:19:36.596 The CC,

NOTE Confidence: 0.915173408333333

00:19:36.600 --> 00:19:38.886 the see T and the TT and what we

NOTE Confidence: 0.915173408333333

00:19:38.886 --> 00:19:41.118 can do for any individual child

NOTE Confidence: 0.915173408333333

00:19:41.118 --> 00:19:43.380 since we now can determine the

NOTE Confidence: 0.915173408333333

00:19:43.380 --> 00:19:45.636 CCC T or TT status of that child

NOTE Confidence: 0.915173408333333

00:19:45.640 --> 00:19:48.652 is then related to performance on

NOTE Confidence: 0.915173408333333

00:19:48.652 --> 00:19:50.660 the decoding composite phenotype.

NOTE Confidence: 0.915173408333333

00:19:50.660 --> 00:19:53.084 And So what you can see here is

NOTE Confidence: 0.915173408333333

00:19:53.084 --> 00:19:56.086 that the CC in in in a single

NOTE Confidence: 0.915173408333333

00:19:56.086 --> 00:19:58.109 individual might my correspond with

NOTE Confidence: 0.915173408333333

00:19:58.109 --> 00:20:00.473 low performance and asked sort of

NOTE Confidence: 0.915173408333333

00:20:00.473 --> 00:20:02.836 in the middle performance and AT&A.

NOTE Confidence: 0.915173408333333

00:20:02.836 --> 00:20:04.404 Why, in other words,

NOTE Confidence: 0.915173408333333

00:20:04.410 --> 00:20:06.734 it would appear here is that the

NOTE Confidence: 0.915173408333333

00:20:06.734 --> 00:20:09.020 C allele is detrimental and that

NOTE Confidence: 0.915173408333333

00:20:09.020 --> 00:20:11.045 the more see you have,

NOTE Confidence: 0.915173408333333

00:20:11.050 --> 00:20:13.250 the lower your performances

NOTE Confidence: 0.915173408333333

00:20:13.250 --> 00:20:16.810 in this decoding composite.

NOTE Confidence: 0.915173408333333

00:20:16.810 --> 00:20:18.390 So there's a relationship here.

NOTE Confidence: 0.915173408333333

00:20:18.390 --> 00:20:20.820 It's actually a linear relationship.

NOTE Confidence: 0.915173408333333

00:20:20.820 --> 00:20:23.900 More see the worse you do Morty,

NOTE Confidence: 0.915173408333333

00:20:23.900 --> 00:20:24.936 the better you do,

NOTE Confidence: 0.915173408333333

00:20:24.936 --> 00:20:27.875 and so if you do this over a lot of

NOTE Confidence: 0.915173408333333

00:20:27.875 --> 00:20:29.525 individuals then you can actually

NOTE Confidence: 0.915173408333333

00:20:29.525 --> 00:20:31.798 get a coefficient of correlation.

NOTE Confidence: 0.915173408333333

00:20:31.800 --> 00:20:34.335 The R-squared over those individuals

NOTE Confidence: 0.915173408333333

00:20:34.335 --> 00:20:37.420 and you could assign that value

NOTE Confidence: 0.915173408333333

00:20:37.420 --> 00:20:39.735 AP value a confidence value.

NOTE Confidence: 0.915173408333333

00:20:39.740 --> 00:20:42.194 And then you can graph that

NOTE Confidence: 0.915173408333333

00:20:42.194 --> 00:20:44.300 value for that individual snip.

NOTE Confidence: 0.915173408333333

00:20:44.300 --> 00:20:48.236 So here for this particular snip

NOTE Confidence: 0.915173408333333

00:20:48.240 --> 00:20:50.724 6935076 located where I said 24

NOTE Confidence: 0.915173408333333

00:20:50.724 --> 00:20:53.710 million etc on chromosome 8 with a

NOTE Confidence: 0.915173408333333

00:20:53.710 --> 00:20:55.800 particular R-squared in 500 children,

NOTE Confidence: 0.915173408333333

00:20:55.800 --> 00:20:58.680 you can graph that on a P value

NOTE Confidence: 0.915173408333333

00:20:58.680 --> 00:21:00.144 on his P value.

NOTE Confidence: 0.915173408333333

00:21:00.144 --> 00:21:01.242 The confidence interval

NOTE Confidence: 0.915173408333333

00:21:01.242 --> 00:21:02.340 for that relationship.

NOTE Confidence: 0.915173408333333

00:21:02.340 --> 00:21:02.992 In fact,

NOTE Confidence: 0.915173408333333

00:21:02.992 --> 00:21:06.182 you can do this for a lot of snips

NOTE Confidence: 0.915173408333333

00:21:06.182 --> 00:21:09.668 on chromosome 8. Not just one.

NOTE Confidence: 0.915173408333333

00:21:09.668 --> 00:21:11.020 In fact.

NOTE Confidence: 0.915173408333333

00:21:11.020 --> 00:21:13.246 Every one of these dots represents

NOTE Confidence: 0.915173408333333

00:21:13.246 --> 00:21:14.977 a different snip genotyped in

NOTE Confidence: 0.915173408333333

00:21:14.977 --> 00:21:16.804 all 500 of our children.

NOTE Confidence: 0.915173408333333

00:21:16.804 --> 00:21:17.626 In fact,

NOTE Confidence: 0.915173408333333

00:21:17.630 --> 00:21:19.828 there are many snips on chromosome 8.

NOTE Confidence: 0.938233537142857

00:21:19.830 --> 00:21:22.756 There's well over 10,000, and so after.

NOTE Confidence: 0.938233537142857

00:21:22.760 --> 00:21:25.245 If you want to present them graphically

NOTE Confidence: 0.938233537142857

00:21:25.245 --> 00:21:27.431 again relative to their P value

NOTE Confidence: 0.938233537142857

00:21:27.431 --> 00:21:29.472 for their R-squared, you literally

NOTE Confidence: 0.938233537142857

00:21:29.472 --> 00:21:31.927 saturate or paint that chromosome.

NOTE Confidence: 0.938233537142857

00:21:31.930 --> 00:21:35.074 So represented here is every snip that we

NOTE Confidence: 0.938233537142857

00:21:35.074 --> 00:21:37.962 tested against the composite phenotype for

NOTE Confidence: 0.938233537142857

00:21:37.962 --> 00:21:41.728 decoding within our cohort of 500 children.

NOTE Confidence: 0.938233537142857

00:21:41.730 --> 00:21:44.664 And in fact we did this for every chromosome,

NOTE Confidence: 0.938233537142857

00:21:44.670 --> 00:21:47.070 so I just depicted chromosome 8.

NOTE Confidence: 0.938233537142857

00:21:47.070 --> 00:21:48.650 But this is chromosome 9,

NOTE Confidence: 0.938233537142857

00:21:48.650 --> 00:21:49.742 chromosome 1011, etc.

NOTE Confidence: 0.938233537142857

00:21:49.742 --> 00:21:52.826 All the way out to 22 and you'll

NOTE Confidence: 0.938233537142857

00:21:52.826 --> 00:21:56.025 notice that one is the widest because

NOTE Confidence: 0.938233537142857

00:21:56.025 --> 00:21:58.179 chromosome one is the longest,

NOTE Confidence: 0.938233537142857

00:21:58.180 --> 00:22:00.564 so it has the most number of snips

NOTE Confidence: 0.938233537142857

00:22:00.570 --> 00:22:03.030 and chromosome 22 is the shortest.

NOTE Confidence: 0.938233537142857

00:22:03.030 --> 00:22:05.669 So has the least number of Snips.

NOTE Confidence: 0.938233537142857

00:22:05.670 --> 00:22:06.814 This is real data.

NOTE Confidence: 0.938233537142857

00:22:06.814 --> 00:22:09.365 This is the real result we call this

NOTE Confidence: 0.938233537142857

00:22:09.365 --> 00:22:11.657 for obvious reasons in Manhattan plot.

NOTE Confidence: 0.938233537142857

00:22:11.660 --> 00:22:13.382 Right, and here's a peek at

NOTE Confidence: 0.938233537142857

00:22:13.382 --> 00:22:14.243 the Manhattan plot.

NOTE Confidence: 0.938233537142857

00:22:14.250 --> 00:22:17.058 In fact, for the decoding composite,

NOTE Confidence: 0.938233537142857

00:22:17.060 --> 00:22:20.192 we got a peak right here on chromosome 19

NOTE Confidence: 0.938233537142857

00:22:20.192 --> 00:22:23.715 by a number of snips in a very small area.

NOTE Confidence: 0.938233537142857

00:22:23.720 --> 00:22:25.100 And because of the magic of

NOTE Confidence: 0.938233537142857

00:22:25.100 --> 00:22:26.020 the Human Genome Project,

NOTE Confidence: 0.938233537142857

00:22:26.020 --> 00:22:28.765 we now can tell since we know precisely what

NOTE Confidence: 0.938233537142857

00:22:28.765 --> 00:22:31.547 the nucleotide number in chromosome it is,

NOTE Confidence: 0.938233537142857

00:22:31.550 --> 00:22:33.520 we can identify the gene

NOTE Confidence: 0.938233537142857

00:22:33.520 --> 00:22:35.096 that this corresponds to,

NOTE Confidence: 0.938233537142857

00:22:35.100 --> 00:22:37.316 and it corresponds to a gene that was

NOTE Confidence: 0.938233537142857

00:22:37.316 --> 00:22:39.100 not previously implicated in reading,

NOTE Confidence: 0.938233537142857

00:22:39.100 --> 00:22:41.468 but which we found to be very strongly

NOTE Confidence: 0.938233537142857

00:22:41.468 --> 00:22:44.556 have a very strong effect size called Gary.

NOTE Confidence: 0.938233537142857

00:22:44.556 --> 00:22:47.727 One in our cohort of 500 children.

NOTE Confidence: 0.938233537142857

00:22:47.730 --> 00:22:49.398 What do I mean by that?

NOTE Confidence: 0.938233537142857

00:22:49.400 --> 00:22:51.648 Let's go back into our cohort of 500

NOTE Confidence: 0.938233537142857

00:22:51.648 --> 00:22:54.221 kids and let's look at four different

NOTE Confidence: 0.938233537142857

00:22:54.221 --> 00:22:56.790 assessments of reading or reading subtests.

NOTE Confidence: 0.938233537142857

00:22:56.790 --> 00:22:59.490 The word, letter ID, word attack.

NOTE Confidence: 0.938233537142857

00:22:59.490 --> 00:23:01.530 Which word letter ID is timed,

NOTE Confidence: 0.938233537142857

00:23:01.530 --> 00:23:03.810 word comprehension, and reading fluency?

NOTE Confidence: 0.938233537142857

00:23:03.810 --> 00:23:04.790 That's the.

NOTE Confidence: 0.938233537142857

00:23:04.790 --> 00:23:06.750 That's the paragraph passage.

NOTE Confidence: 0.938233537142857

00:23:06.750 --> 00:23:08.894 And let's look at kids who have the

NOTE Confidence: 0.938233537142857

00:23:08.894 --> 00:23:11.150 Gary run risk allele here in orange,

NOTE Confidence: 0.938233537142857

00:23:11.150 --> 00:23:14.126 and you can see is that they enter

NOTE Confidence: 0.938233537142857

00:23:14.126 --> 00:23:16.811 first grade behind the kids in the

NOTE Confidence: 0.938233537142857

00:23:16.811 --> 00:23:19.400 same cohort at the same schools.

NOTE Confidence: 0.938233537142857

00:23:19.400 --> 00:23:22.336 At the same age in the same grade,

NOTE Confidence: 0.938233537142857

00:23:22.340 --> 00:23:23.600 at at, at, at, at,

NOTE Confidence: 0.938233537142857

00:23:23.600 --> 00:23:24.928 at a significant disadvantage.

NOTE Confidence: 0.938233537142857

00:23:24.928 --> 00:23:27.349 And if we follow these same kids

NOTE Confidence: 0.938233537142857

00:23:27.349 --> 00:23:29.209 because it's a longitudinal study,

NOTE Confidence: 0.938233537142857

00:23:29.210 --> 00:23:32.129 you can see they never catch up.

NOTE Confidence: 0.938233537142857

00:23:32.130 --> 00:23:34.026 Let me show you what that looks like.

NOTE Confidence: 0.938233537142857

00:23:34.030 --> 00:23:35.566 This is a comprehension,

NOTE Confidence: 0.938233537142857

00:23:35.566 --> 00:23:35.950 right,

NOTE Confidence: 0.938233537142857

00:23:35.950 --> 00:23:38.310 a fundamental and important things

NOTE Confidence: 0.938233537142857

00:23:38.310 --> 00:23:39.192 skill in reading.

NOTE Confidence: 0.938233537142857

00:23:39.192 --> 00:23:41.835 If we look at kids in grade at the

NOTE Confidence: 0.938233537142857

00:23:41.835 --> 00:23:44.234 start of grade one at the end of Grade

NOTE Confidence: 0.938233537142857

00:23:44.234 --> 00:23:46.826 1 starter grade two end of grade 2 all

NOTE Confidence: 0.938233537142857

00:23:46.830 --> 00:23:48.747 the way up to the start of grade five,

NOTE Confidence: 0.938233537142857

00:23:48.750 --> 00:23:50.630 you can see is that children in oak.

NOTE Confidence: 0.938233537142857

00:23:50.630 --> 00:23:52.538 Our cohort here at the risk

NOTE Confidence: 0.938233537142857

00:23:52.538 --> 00:23:53.810 allele for Gary One,

NOTE Confidence: 0.938233537142857

00:23:53.810 --> 00:23:55.280 started off at a disadvantage

NOTE Confidence: 0.938233537142857

00:23:55.280 --> 00:23:57.449 to kids who do not carry any

NOTE Confidence: 0.938233537142857

00:23:57.449 --> 00:23:59.024 risk alleles for Gary one,

NOTE Confidence: 0.938233537142857

00:23:59.030 --> 00:24:00.326 and it's never really.

NOTE Confidence: 0.938233537142857

00:24:00.326 --> 00:24:02.270 They never really filled a gap.

NOTE Confidence: 0.938233537142857

00:24:02.270 --> 00:24:04.470 Even at the start of the Great Five,

NOTE Confidence: 0.938233537142857

00:24:04.470 --> 00:24:05.400 so it's sustained.

NOTE Confidence: 0.938233537142857

00:24:05.400 --> 00:24:07.980 It's a sustain effect over this age group.

NOTE Confidence: 0.887454495555556

00:24:11.570 --> 00:24:13.694 We can look further into Gary one we didn't

NOTE Confidence: 0.887454495555556

00:24:13.694 --> 00:24:15.810 know this so we looked in the text portal,

NOTE Confidence: 0.887454495555556

00:24:15.810 --> 00:24:18.704 which gives you expression data in different

NOTE Confidence: 0.887454495555556

00:24:18.704 --> 00:24:20.726 parts of the body and specifically

NOTE Confidence: 0.887454495555556

00:24:20.726 --> 00:24:22.529 in different parts of the brain.

NOTE Confidence: 0.887454495555556

00:24:22.530 --> 00:24:24.784 And to our surprise, Gary went well.

NOTE Confidence: 0.887454495555556

00:24:24.790 --> 00:24:26.320 It's not surprising that Gary

NOTE Confidence: 0.887454495555556

00:24:26.320 --> 00:24:27.850 wins expressed in the brain,

NOTE Confidence: 0.887454495555556

00:24:27.850 --> 00:24:29.850 but its strongest expression is

NOTE Confidence: 0.887454495555556

00:24:29.850 --> 00:24:32.216 in the cerebellum, the cerebellum

NOTE Confidence: 0.887454495555556

00:24:32.216 --> 00:24:34.548 hemisphere and total cerebellum.

NOTE Confidence: 0.887454495555556

00:24:34.550 --> 00:24:35.926 That was a surprise.

NOTE Confidence: 0.887454495555556

00:24:35.926 --> 00:24:38.419 But not really that much because what

NOTE Confidence: 0.887454495555556

00:24:38.419 --> 00:24:40.960 we know is that the cerebellum is

NOTE Confidence: 0.887454495555556

00:24:40.960 --> 00:24:43.249 intimately linked to the cerebral cortex,

NOTE Confidence: 0.887454495555556

00:24:43.250 --> 00:24:46.622 the cortical area where there are

NOTE Confidence: 0.887454495555556

00:24:46.622 --> 00:24:48.870 specific and specified specialized

NOTE Confidence: 0.887454495555556

00:24:48.960 --> 00:24:52.403 reading areas by a circuit or a

NOTE Confidence: 0.887454495555556

00:24:52.403 --> 00:24:55.007 cerebellar cerebral cortex loop.

NOTE Confidence: 0.887454495555556

00:24:55.010 --> 00:24:57.222 This is well known and in fact

NOTE Confidence: 0.887454495555556

00:24:57.222 --> 00:24:59.505 its support of a theory that was

NOTE Confidence: 0.887454495555556

00:24:59.505 --> 00:25:02.531 put forward in the 1990s called a

NOTE Confidence: 0.887454495555556

00:25:02.531 --> 00:25:05.466 cerebellar theory of reading disability.

NOTE Confidence: 0.887454495555556

00:25:05.470 --> 00:25:07.465 Nicholson Faucet observed that reading

NOTE Confidence: 0.887454495555556

00:25:07.465 --> 00:25:09.460 disability was also associated with

NOTE Confidence: 0.887454495555556

00:25:09.517 --> 00:25:11.727 deficits in cerebellar related functions.

NOTE Confidence: 0.887454495555556

00:25:11.730 --> 00:25:15.270 Distonia time estimation skill

NOTE Confidence: 0.887454495555556

00:25:15.270 --> 00:25:17.925 optimization and balance,

NOTE Confidence: 0.887454495555556

00:25:17.930 --> 00:25:20.702 and so they posited that the cortical

NOTE Confidence: 0.887454495555556

00:25:20.702 --> 00:25:22.654 cerebellar circuit shown here has

NOTE Confidence: 0.887454495555556

00:25:22.654 --> 00:25:24.389 an important role in reading.

NOTE Confidence: 0.887454495555556

00:25:24.390 --> 00:25:26.357 There has now been a whole lot

NOTE Confidence: 0.887454495555556

00:25:26.357 --> 00:25:26.919 more published.

NOTE Confidence: 0.887454495555556

00:25:26.920 --> 00:25:28.660 On the cerebellar theory of reading.

NOTE Confidence: 0.887454495555556

00:25:28.660 --> 00:25:30.592 And sometimes some people are in

NOTE Confidence: 0.887454495555556

00:25:30.592 --> 00:25:32.419 favor and some people are not,

NOTE Confidence: 0.887454495555556

00:25:32.420 --> 00:25:34.535 but we go where the science is taking us.

NOTE Confidence: 0.887454495555556

00:25:34.540 --> 00:25:36.340 And since Gary one is implicated,

NOTE Confidence: 0.887454495555556

00:25:36.340 --> 00:25:38.740 certainly by association studies,

NOTE Confidence: 0.887454495555556

00:25:38.740 --> 00:25:40.540 we pursue that.

NOTE Confidence: 0.887454495555556

00:25:40.540 --> 00:25:42.404 And so I don't really have the time

NOTE Confidence: 0.887454495555556

00:25:42.404 --> 00:25:44.415 to go through all the data and

NOTE Confidence: 0.887454495555556

00:25:44.415 --> 00:25:46.300 all the projects that we're going,

NOTE Confidence: 0.887454495555556

00:25:46.300 --> 00:25:48.712 so let me sort of summarize

NOTE Confidence: 0.887454495555556

00:25:48.712 --> 00:25:49.918 those briefly here.

NOTE Confidence: 0.887454495555556

00:25:49.920 --> 00:25:51.360 So our New Haven,

NOTE Confidence: 0.887454495555556

00:25:51.360 --> 00:25:52.080 Lexington project,

NOTE Confidence: 0.887454495555556

00:25:52.080 --> 00:25:54.456 which began to implicate the cerebellum,

NOTE Confidence: 0.887454495555556

00:25:54.460 --> 00:25:56.735 actually spurred a number of

NOTE Confidence: 0.887454495555556

00:25:56.735 --> 00:25:58.434 interesting projects Haley Dasilva

NOTE Confidence: 0.887454495555556

00:25:58.434 --> 00:26:00.786 in our lab has actually worked

NOTE Confidence: 0.887454495555556

00:26:00.786 --> 00:26:03.823 on a a program for processing and

NOTE Confidence: 0.887454495555556

00:26:03.823 --> 00:26:05.747 preprocessing imaging data that

NOTE Confidence: 0.887454495555556

00:26:05.747 --> 00:26:08.050 she calls Neuro Stack specifically

NOTE Confidence: 0.887454495555556

00:26:08.050 --> 00:26:11.194 made for a WS to Amazon Web server.

NOTE Confidence: 0.887454495555556

00:26:11.200 --> 00:26:12.415 And that's really important because

NOTE Confidence: 0.887454495555556

00:26:12.415 --> 00:26:13.900 a lot of the imaging data,

NOTE Confidence: 0.887454495555556

00:26:13.900 --> 00:26:16.516 for example from ABCD, is stored,

NOTE Confidence: 0.887454495555556

00:26:16.520 --> 00:26:16.947 allocated,

NOTE Confidence: 0.887454495555556

00:26:16.947 --> 00:26:19.509 processed and worked on in an

NOTE Confidence: 0.887454495555556

00:26:19.509 --> 00:26:21.859 Amazon Web Services up on the web.

NOTE Confidence: 0.887454495555556

00:26:21.860 --> 00:26:24.460 So in this is all cloud based work

NOTE Confidence: 0.887454495555556

00:26:24.460 --> 00:26:26.561 and Haley actually created this

NOTE Confidence: 0.887454495555556

00:26:26.561 --> 00:26:29.309 new tool that is now generally

NOTE Confidence: 0.887454495555556

00:26:29.309 --> 00:26:31.820 available as it's free and it's

NOTE Confidence: 0.887454495555556

00:26:31.820 --> 00:26:33.340 incredibly useful for neuroscientists.

NOTE Confidence: 0.887454495555556

00:26:33.340 --> 00:26:36.466 You know who don't want to get into

NOTE Confidence: 0.887454495555556

00:26:36.466 --> 00:26:38.416 the specifics of preprocessing and

NOTE Confidence: 0.887454495555556

00:26:38.416 --> 00:26:41.440 processing data. Tremendous work.

NOTE Confidence: 0.887454495555556

00:26:41.440 --> 00:26:43.840 We also calcium xerac in our lab who's

NOTE Confidence: 0.887454495555556

00:26:43.840 --> 00:26:46.268 been working with Young Frieder is unusual.

NOTE Confidence: 0.887454495555556

00:26:46.270 --> 00:26:46.818 Haley also,

NOTE Confidence: 0.887454495555556

00:26:46.818 --> 00:26:48.188 as well as Emily Curtain,

NOTE Confidence: 0.887454495555556

00:26:48.190 --> 00:26:49.930 has been working in ABCD.

NOTE Confidence: 0.887454495555556

00:26:49.930 --> 00:26:53.872 ABCD is a longitudinal study of

NOTE Confidence: 0.887454495555556

00:26:53.872 --> 00:26:55.906 typically developing 10,000 US

NOTE Confidence: 0.887454495555556

00:26:55.906 --> 00:26:58.054 children from across like 32 sites

NOTE Confidence: 0.887454495555556

00:26:58.054 --> 00:27:00.638 in the United States and they're

NOTE Confidence: 0.887454495555556

00:27:00.638 --> 00:27:02.434 getting cereal imaging studies

NOTE Confidence: 0.887454495555556

00:27:02.434 --> 00:27:04.389 as well as genotyping.

NOTE Confidence: 0.887454495555556

00:27:04.390 --> 00:27:04.801 Genotyping,

NOTE Confidence: 0.887454495555556

00:27:04.801 --> 00:27:07.267 one serial imaging studies and and

NOTE Confidence: 0.887454495555556

00:27:07.267 --> 00:27:09.526 as and some cognitive assessments

NOTE Confidence: 0.887454495555556

00:27:09.526 --> 00:27:11.418 to the NH Toolbox.

NOTE Confidence: 0.887454495555556

00:27:11.420 --> 00:27:13.400 That data is publicly available and

NOTE Confidence: 0.887454495555556

00:27:13.400 --> 00:27:15.896 so with kelson's been doing is he's

NOTE Confidence: 0.887454495555556

00:27:15.896 --> 00:27:17.751 been doing genetic correlation studies

NOTE Confidence: 0.887454495555556

00:27:17.751 --> 00:27:20.060 between the Leccinum project and ABCD,

NOTE Confidence: 0.887454495555556

00:27:20.060 --> 00:27:22.076 and in a way that he's been

NOTE Confidence: 0.887454495555556

00:27:22.076 --> 00:27:24.388 using these to create sort of to

NOTE Confidence: 0.887454495555556

00:27:24.388 --> 00:27:26.446 leverage our small data set with

NOTE Confidence: 0.855115656666667

00:27:26.522 --> 00:27:28.640 a larger data set. This is a theme

NOTE Confidence: 0.855115656666667

00:27:28.640 --> 00:27:30.459 that that goes on and on with us.

NOTE Confidence: 0.73252445

00:27:32.580 --> 00:27:36.250 Seeing Wang has been working by doing

NOTE Confidence: 0.73252445

00:27:36.250 --> 00:27:39.577 our due osis one I just showed you as

NOTE Confidence: 0.73252445

00:27:39.577 --> 00:27:43.097 well as T Ross is Tiwa Sizarr transcript

NOTE Confidence: 0.73252445

00:27:43.097 --> 00:27:45.313 transcript own wide association studies

NOTE Confidence: 0.73252445

00:27:45.313 --> 00:27:48.805 and So what she does is she goes back

NOTE Confidence: 0.73252445

00:27:48.805 --> 00:27:50.695 into GTX that expression data data

NOTE Confidence: 0.73252445

00:27:50.695 --> 00:27:53.236 data set in the brain either in the

NOTE Confidence: 0.73252445

00:27:53.236 --> 00:27:54.857 celebra ballimore the whole brain

NOTE Confidence: 0.73252445

00:27:54.857 --> 00:27:56.747 and she uses that information to

NOTE Confidence: 0.73252445

00:27:56.747 --> 00:28:00.140 wait the snips for the for the guasa.

NOTE Confidence: 0.73252445

00:28:00.140 --> 00:28:02.124 Therefore it's called that

NOTE Confidence: 0.73252445

00:28:02.124 --> 00:28:03.116 waser transcriptome.

NOTE Confidence: 0.73252445

00:28:03.120 --> 00:28:06.046 Wide Association study and she's and and

NOTE Confidence: 0.73252445

00:28:06.046 --> 00:28:08.860 we've been working with helping as well.

NOTE Confidence: 0.73252445

00:28:08.860 --> 00:28:11.146 Helping Zang Kate Connors from the

NOTE Confidence: 0.73252445

00:28:11.146 --> 00:28:13.363 group with young Frieders has been

NOTE Confidence: 0.73252445

00:28:13.363 --> 00:28:15.229 doing looking at our math data

NOTE Confidence: 0.73252445

00:28:15.229 --> 00:28:16.940 because I think initially,

NOTE Confidence: 0.73252445

00:28:16.940 --> 00:28:18.825 when I explained how the

NOTE Confidence: 0.73252445

00:28:18.825 --> 00:28:19.956 election project works,

NOTE Confidence: 0.73252445

00:28:19.960 --> 00:28:22.010 we do executive function which

NOTE Confidence: 0.73252445

00:28:22.010 --> 00:28:24.480 includes attention as well as math,

NOTE Confidence: 0.73252445

00:28:24.480 --> 00:28:25.844 math subjects as well.

NOTE Confidence: 0.73252445

00:28:25.844 --> 00:28:27.890 So Kate's been been really focusing

NOTE Confidence: 0.73252445

00:28:27.957 --> 00:28:30.213 on math and we'll be hearing some more

NOTE Confidence: 0.73252445

00:28:30.213 --> 00:28:32.784 data from that in the next couple of years.

NOTE Confidence: 0.73252445

00:28:32.790 --> 00:28:34.578 And then finally Steven Penny Agra.

NOTE Confidence: 0.73252445

00:28:34.580 --> 00:28:36.800 His spirit had had a collaboration

NOTE Confidence: 0.73252445

00:28:36.800 --> 00:28:39.573 with Indian Park over the stem Cell

NOTE Confidence: 0.73252445

00:28:39.573 --> 00:28:41.618 center and developing neurons human

NOTE Confidence: 0.73252445

00:28:41.618 --> 00:28:43.558 neurons from human embryonic stem

NOTE Confidence: 0.73252445

00:28:43.558 --> 00:28:46.008 cells and so the idea here being

NOTE Confidence: 0.73252445

00:28:46.010 --> 00:28:47.270 is that one of the things that's

NOTE Confidence: 0.73252445

00:28:47.270 --> 00:28:47.810 really held back.

NOTE Confidence: 0.73252445

00:28:47.810 --> 00:28:50.306 Translational Neuroscience is access

NOTE Confidence: 0.73252445

00:28:50.306 --> 00:28:53.426 to brain human brain material,

NOTE Confidence: 0.73252445

00:28:53.430 --> 00:28:54.454 and so unlike cancer,

NOTE Confidence: 0.73252445

00:28:54.454 --> 00:28:56.550 when you can get lots of material,

NOTE Confidence: 0.73252445

00:28:56.550 --> 00:28:59.838 in fact it's would be difficult.

NOTE Confidence: 0.73252445

00:28:59.840 --> 00:29:02.234 I would say it's impossible to get.

NOTE Confidence: 0.73252445

00:29:02.240 --> 00:29:05.138 Human brain material from from normal brains.

NOTE Confidence: 0.73252445

00:29:05.140 --> 00:29:07.060 And so in order to.

NOTE Confidence: 0.73252445

00:29:07.060 --> 00:29:09.496 If you want to study human neurons

NOTE Confidence: 0.73252445

00:29:09.496 --> 00:29:12.393 that what you do is you get human

NOTE Confidence: 0.73252445

00:29:12.393 --> 00:29:14.168 embryonic stem cells and then

NOTE Confidence: 0.73252445

00:29:14.248 --> 00:29:17.510 you begin to develop you.

NOTE Confidence: 0.73252445

00:29:17.510 --> 00:29:20.036 You can induce them to develop

NOTE Confidence: 0.73252445

00:29:20.036 --> 00:29:22.409 into human neurons along the way,

NOTE Confidence: 0.73252445

00:29:22.410 --> 00:29:24.492 and what Steven has done is

NOTE Confidence: 0.73252445

00:29:24.492 --> 00:29:26.430 he's knocked down using CRISPR.

NOTE Confidence: 0.73252445

00:29:26.430 --> 00:29:30.516 The expression of a prominent reading

NOTE Confidence: 0.73252445

00:29:30.520 --> 00:29:33.061 or dyslexia gene called KA 319 and

NOTE Confidence: 0.73252445

00:29:33.061 --> 00:29:35.683 what he's shown is that this puts

NOTE Confidence: 0.73252445

00:29:35.683 --> 00:29:37.861 the cells in a quiessence state,

NOTE Confidence: 0.73252445

00:29:37.870 --> 00:29:40.120 so these are neuronal progenitors

NOTE Confidence: 0.73252445

00:29:40.120 --> 00:29:42.370 arrested in a quiescent state.

NOTE Confidence: 0.73252445

00:29:42.370 --> 00:29:44.578 So to analyze that data which you know

NOTE Confidence: 0.73252445

00:29:44.578 --> 00:29:46.987 we've been doing a lot of sequencing there,

NOTE Confidence: 0.73252445

00:29:46.990 --> 00:29:47.606 is you.

NOTE Confidence: 0.73252445

00:29:47.606 --> 00:29:48.838 You are a few,

NOTE Confidence: 0.73252445

00:29:48.840 --> 00:29:50.760 I'm just doing a marvelous job

NOTE Confidence: 0.73252445

00:29:50.760 --> 00:29:52.448 again from Helping's group and one

NOTE Confidence: 0.73252445

00:29:52.448 --> 00:29:53.496 of our undergraduate students.

NOTE Confidence: 0.73252445

00:29:53.500 --> 00:29:54.499 Is he Lopez?

NOTE Confidence: 0.73252445

00:29:54.499 --> 00:29:56.497 So these are things that are

NOTE Confidence: 0.73252445

00:29:56.497 --> 00:29:57.420 currently ongoing.

NOTE Confidence: 0.73252445

00:29:57.420 --> 00:29:58.960 Major projects in the lab.

NOTE Confidence: 0.73252445

00:29:58.960 --> 00:30:00.568 I don't have time to talk about a

NOTE Confidence: 0.73252445

00:30:00.568 --> 00:30:02.764 whole lot today, but I just wanted

NOTE Confidence: 0.73252445

00:30:02.764 --> 00:30:04.960 to know that they're going on.

NOTE Confidence: 0.73252445

00:30:04.960 --> 00:30:05.291 OK,

NOTE Confidence: 0.73252445

00:30:05.291 --> 00:30:07.608 so the question is or what the

NOTE Confidence: 0.73252445

00:30:07.608 --> 00:30:09.971 question I posed before I left this

NOTE Confidence: 0.73252445

00:30:09.971 --> 00:30:12.700 slide was how do we do this magic?

NOTE Confidence: 0.73252445

00:30:12.700 --> 00:30:14.356 How do we identify these children

NOTE Confidence: 0.73252445

00:30:14.356 --> 00:30:16.920 early and when I said was we do this

NOTE Confidence: 0.73252445

00:30:16.920 --> 00:30:18.710 molecular genetic studies and I showed

NOTE Confidence: 0.73252445

00:30:18.710 --> 00:30:20.978 you a nice example focusing on dyslexia.

NOTE Confidence: 0.86051457125

00:30:23.970 --> 00:30:26.850 But do we really disrupt by doing this?

NOTE Confidence: 0.86051457125

00:30:26.850 --> 00:30:28.806 Do we really disrupt the current

NOTE Confidence: 0.86051457125

00:30:28.806 --> 00:30:29.784 current educational program?

NOTE Confidence: 0.86051457125

00:30:29.790 --> 00:30:32.000 Like how to disrupt the

NOTE Confidence: 0.86051457125

00:30:32.000 --> 00:30:33.326 current educational paradigm?

NOTE Confidence: 0.86051457125

00:30:33.330 --> 00:30:35.818 Is that really the question or is the

NOTE Confidence: 0.86051457125

00:30:35.818 --> 00:30:38.551 question is how do we really disrupt

NOTE Confidence: 0.86051457125

00:30:38.551 --> 00:30:40.187 the current educational paradigm?

NOTE Confidence: 0.86051457125

00:30:40.190 --> 00:30:41.290 And I think that's really,

NOTE Confidence: 0.86051457125

00:30:41.290 --> 00:30:43.108 really an important question for us,

NOTE Confidence: 0.86051457125

00:30:43.110 --> 00:30:44.886 because doing our studies

NOTE Confidence: 0.86051457125

00:30:44.886 --> 00:30:46.218 and publishing them,

NOTE Confidence: 0.86051457125

00:30:46.220 --> 00:30:48.015 even publishing them in peer

NOTE Confidence: 0.86051457125

00:30:48.015 --> 00:30:49.810 reviewed journals has been great.

NOTE Confidence: 0.86051457125

00:30:49.810 --> 00:30:51.190 It's been great. You know,

NOTE Confidence: 0.86051457125

00:30:51.190 --> 00:30:52.710 we've been able to get support for that,

NOTE Confidence: 0.86051457125

00:30:52.710 --> 00:30:53.835 both private foundation.

NOTE Confidence: 0.86051457125

00:30:53.835 --> 00:30:55.335 Age foundation and do

NOTE Confidence: 0.86051457125

00:30:55.335 --> 00:30:56.990 these really cool studies,

NOTE Confidence: 0.86051457125

00:30:56.990 --> 00:30:58.690 but are we really moving

NOTE Confidence: 0.86051457125

00:30:58.690 --> 00:31:00.050 them into the classroom?

NOTE Confidence: 0.86051457125

00:31:00.050 --> 00:31:01.569 And I would say I have to

NOTE Confidence: 0.86051457125

00:31:01.569 --> 00:31:03.230 admit in fact that we were not.

NOTE Confidence: 0.86051457125

00:31:03.230 --> 00:31:05.254 So if we really want to do this,

NOTE Confidence: 0.86051457125

00:31:05.260 --> 00:31:07.156 where can we make these changes

NOTE Confidence: 0.86051457125

00:31:07.156 --> 00:31:09.290 so we can translate our findings?

NOTE Confidence: 0.86051457125

00:31:09.290 --> 00:31:11.018 Our ability to identify kids at

NOTE Confidence: 0.86051457125

00:31:11.018 --> 00:31:12.551 high risk for learning disabilities

NOTE Confidence: 0.86051457125

00:31:12.551 --> 00:31:14.826 at a young age when it's really

NOTE Confidence: 0.86051457125

00:31:14.826 --> 00:31:16.230 important saying kindergarten?

NOTE Confidence: 0.86051457125

00:31:16.230 --> 00:31:18.715 How do we get that adopted in

NOTE Confidence: 0.86051457125

00:31:18.715 --> 00:31:20.410 public schools across America?

NOTE Confidence: 0.86051457125

00:31:20.410 --> 00:31:22.050 Even in New Haven,

NOTE Confidence: 0.86051457125

00:31:22.050 --> 00:31:25.210 across the state of Connecticut or America?

NOTE Confidence: 0.86051457125

00:31:25.210 --> 00:31:26.954 So to do that,

NOTE Confidence: 0.86051457125

00:31:26.954 --> 00:31:29.570 we really need policy level change.

NOTE Confidence: 0.86051457125

00:31:29.570 --> 00:31:31.390 In the last five years,

NOTE Confidence: 0.86051457125

00:31:31.390 --> 00:31:33.170 dyslexia and learning disability

NOTE Confidence: 0.86051457125

00:31:33.170 --> 00:31:35.840 policies at the state and federal

NOTE Confidence: 0.86051457125

00:31:35.909 --> 00:31:38.269 levels have improved significantly,

NOTE Confidence: 0.86051457125

00:31:38.270 --> 00:31:40.724 most notably in the areas of

NOTE Confidence: 0.86051457125

00:31:40.724 --> 00:31:42.360 teacher training and universal

NOTE Confidence: 0.86051457125

00:31:42.430 --> 00:31:44.438 dyslexia screening in grades,

NOTE Confidence: 0.86051457125

00:31:44.440 --> 00:31:47.780 kindergarten through third grade.

NOTE Confidence: 0.86051457125

00:31:47.780 --> 00:31:50.180 41 states today have universal

NOTE Confidence: 0.86051457125

00:31:50.180 --> 00:31:52.580 evidence based screening for dyslexia,

NOTE Confidence: 0.86051457125

00:31:52.580 --> 00:31:56.068 including Connecticut and Massachusetts.

NOTE Confidence: 0.86051457125

00:31:56.070 --> 00:31:57.799 And the feds have clarified that you

NOTE Confidence: 0.86051457125

00:31:57.799 --> 00:32:00.296 can now use this term Once Upon you couldn't.

NOTE Confidence: 0.86051457125

00:32:00.300 --> 00:32:03.025 You could use this term when,

NOTE Confidence: 0.86051457125

00:32:03.025 --> 00:32:03.540 when,

NOTE Confidence: 0.86051457125

00:32:03.540 --> 00:32:06.023 when teachers create the iep's,

NOTE Confidence: 0.86051457125

00:32:06.023 --> 00:32:07.292 the individual educational

NOTE Confidence: 0.86051457125

00:32:07.292 --> 00:32:09.830 programs that are so important in

NOTE Confidence: 0.86051457125

00:32:09.893 --> 00:32:12.389 mandated for each child that has

NOTE Confidence: 0.86051457125

00:32:12.389 --> 00:32:14.053 a disability learning disability,

NOTE Confidence: 0.86051457125

00:32:14.060 --> 00:32:16.664 32 states across the country provide a

NOTE Confidence: 0.86051457125

00:32:16.664 --> 00:32:19.548 list of approved evidence based screeners.

NOTE Confidence: 0.86051457125

00:32:19.550 --> 00:32:23.370 None of them are genetic.

NOTE Confidence: 0.86051457125

00:32:23.370 --> 00:32:26.226 So our goal is to pass legislation

NOTE Confidence: 0.86051457125

00:32:26.226 --> 00:32:28.427 that includes reliable and validated

NOTE Confidence: 0.86051457125

00:32:28.427 --> 00:32:31.248 genetic screening for risk of, say,

NOTE Confidence: 0.86051457125

00:32:31.248 --> 00:32:34.088 dyslexia or any learning disability.

NOTE Confidence: 0.86051457125

00:32:34.090 --> 00:32:35.182 And get it,

NOTE Confidence: 0.86051457125

00:32:35.182 --> 00:32:37.366 get it on the improved list

NOTE Confidence: 0.86051457125

00:32:37.366 --> 00:32:39.990 of evidence based screeners.

NOTE Confidence: 0.86051457125

00:32:39.990 --> 00:32:42.138 This would allow parents to screen

NOTE Confidence: 0.86051457125

00:32:42.138 --> 00:32:44.550 their child as early as even birth,

NOTE Confidence: 0.86051457125

00:32:44.550 --> 00:32:46.209 but definitely pre K for risk of

NOTE Confidence: 0.86051457125

00:32:46.209 --> 00:32:48.189 any of the learning disabilities,

NOTE Confidence: 0.86051457125

00:32:48.190 --> 00:32:49.062 including dyslexia.

NOTE Confidence: 0.86051457125

00:32:49.062 --> 00:32:51.242 It would require school districts

NOTE Confidence: 0.86051457125

00:32:51.242 --> 00:32:53.744 to take those results into account

NOTE Confidence: 0.86051457125

00:32:53.744 --> 00:32:56.000 when when they create the iips,

NOTE Confidence: 0.86051457125

00:32:56.000 --> 00:32:57.416 the individual educational

NOTE Confidence: 0.86051457125

00:32:57.416 --> 00:33:01.700 program plans and the 504 plans.

NOTE Confidence: 0.86051457125

00:33:01.700 --> 00:33:03.545 And this would enable children

NOTE Confidence: 0.86051457125

00:33:03.545 --> 00:33:05.868 finally to receive an evidence based

NOTE Confidence: 0.86051457125

00:33:05.868 --> 00:33:07.536 reading instruction or intervention

NOTE Confidence: 0.86051457125

00:33:07.536 --> 00:33:09.621 method at the very earliest

NOTE Confidence: 0.86051457125

00:33:09.685 --> 00:33:11.497 stages of reading acquisition,

NOTE Confidence: 0.86051457125

00:33:11.500 --> 00:33:13.910 when they are most important

NOTE Confidence: 0.86051457125

00:33:13.910 --> 00:33:16.890 and are most likely to work.

NOTE Confidence: 0.86051457125

00:33:16.890 --> 00:33:19.550 So I've last 20 minutes or so.

NOTE Confidence: 0.86051457125

00:33:19.550 --> 00:33:21.780 I presented a hodgepodge really

NOTE Confidence: 0.86051457125

00:33:21.780 --> 00:33:24.010 of information from a number

NOTE Confidence: 0.86051457125

00:33:24.092 --> 00:33:26.400 of seemingly discordant fields.

NOTE Confidence: 0.86051457125

00:33:26.400 --> 00:33:28.630 I presented some epidemiological data

NOTE Confidence: 0.86051457125

00:33:28.630 --> 00:33:31.330 showing what is the frequency of of.

NOTE Confidence: 0.86051457125

00:33:31.330 --> 00:33:33.240 Well, I presented reading disability,

NOTE Confidence: 0.86051457125

00:33:33.240 --> 00:33:35.305 but in fact of learning disabilities and

NOTE Confidence: 0.86051457125

00:33:35.305 --> 00:33:37.301 it's somewhere in the 10 to 20% range,

NOTE Confidence: 0.86051457125

00:33:37.301 --> 00:33:38.865 I presented an intervention

NOTE Confidence: 0.86051457125

00:33:38.865 --> 00:33:41.294 program from my colleague or or

NOTE Confidence: 0.86051457125

00:33:41.294 --> 00:33:43.339 the results of an intervention

NOTE Confidence: 0.86051457125

00:33:43.339 --> 00:33:44.975 intense intervention program for

NOTE Confidence: 0.893695270869565

00:33:45.046 --> 00:33:46.348 my colleague Maureen.

NOTE Confidence: 0.893695270869565

00:33:46.350 --> 00:33:48.240 Love it at the University of Toronto

NOTE Confidence: 0.893695270869565

00:33:48.240 --> 00:33:49.949 and showed how important it is.

NOTE Confidence: 0.893695270869565

00:33:49.950 --> 00:33:51.820 For early intervention and for

NOTE Confidence: 0.893695270869565

00:33:51.820 --> 00:33:54.915 it to work and to be and for

NOTE Confidence: 0.893695270869565

00:33:54.915 --> 00:33:56.815 its effects to be sustained.

NOTE Confidence: 0.893695270869565

00:33:56.820 --> 00:33:58.956 I presented some genetic genetic studies,

NOTE Confidence: 0.893695270869565

00:33:58.960 --> 00:34:00.312 both molecular genetic studies

NOTE Confidence: 0.893695270869565

00:34:00.312 --> 00:34:01.664 and statistical genetic studies

NOTE Confidence: 0.893695270869565

00:34:01.664 --> 00:34:03.318 to show the importance of

NOTE Confidence: 0.893695270869565

00:34:03.318 --> 00:34:04.858 genetics and why genetics should,

NOTE Confidence: 0.893695270869565

00:34:04.860 --> 00:34:07.198 could and should be used for early

NOTE Confidence: 0.893695270869565

00:34:07.198 --> 00:34:09.342 screening to identify kids at high

NOTE Confidence: 0.893695270869565

00:34:09.342 --> 00:34:10.774 risk for attention disorders,

NOTE Confidence: 0.893695270869565

00:34:10.780 --> 00:34:12.388 reading disabilities,

NOTE Confidence: 0.893695270869565

00:34:12.388 --> 00:34:14.800 language disorders, etc.

NOTE Confidence: 0.893695270869565

00:34:14.800 --> 00:34:17.008 And I presented an education paradigm

NOTE Confidence: 0.893695270869565

00:34:17.008 --> 00:34:19.788 that doesn't work the wait to fail role

NOTE Confidence: 0.893695270869565

00:34:19.788 --> 00:34:22.100 model and an alternative to that model.

NOTE Confidence: 0.893695270869565

00:34:22.100 --> 00:34:24.560 And finally I I presented some

NOTE Confidence: 0.893695270869565

00:34:24.560 --> 00:34:27.940 policy stuff and so the fact is

NOTE Confidence: 0.893695270869565

00:34:27.940 --> 00:34:30.440 is that it's a bit of a mess,

NOTE Confidence: 0.893695270869565

00:34:30.440 --> 00:34:32.932 so to find a form that accommodates

NOTE Confidence: 0.893695270869565

00:34:32.932 --> 00:34:35.144 the entire mess that I've just

NOTE Confidence: 0.893695270869565

00:34:35.144 --> 00:34:37.636 presented and to unite these from my

NOTE Confidence: 0.893695270869565

00:34:37.712 --> 00:34:40.442 friend Samuel Becker from 1961 and

NOTE Confidence: 0.893695270869565

00:34:40.442 --> 00:34:42.897 to unite these seemingly unrelated

NOTE Confidence: 0.893695270869565

00:34:42.897 --> 00:34:45.620 initiatives under a single umbrella

NOTE Confidence: 0.893695270869565

00:34:45.620 --> 00:34:47.670 this year.

NOTE Confidence: 0.893695270869565

00:34:47.670 --> 00:34:50.070 With a lot of help from Gene Shapiro,

NOTE Confidence: 0.893695270869565

00:34:50.070 --> 00:34:52.750 Cliff Boag and the Dean,

NOTE Confidence: 0.893695270869565

00:34:52.750 --> 00:34:57.202 we created the Yale Program for

NOTE Confidence: 0.893695270869565

00:34:57.202 --> 00:34:59.428 Learning Disabilities Research.

NOTE Confidence: 0.893695270869565

00:34:59.430 --> 00:35:01.430 Our program is multidisciplinary.

NOTE Confidence: 0.893695270869565

00:35:01.430 --> 00:35:04.430 It covers the fields of neuropsychology,

NOTE Confidence: 0.893695270869565

00:35:04.430 --> 00:35:05.030 Biostatistics,

NOTE Confidence: 0.893695270869565

00:35:05.030 --> 00:35:06.230 education, neuroimaging,

NOTE Confidence: 0.893695270869565

00:35:06.230 --> 00:35:09.230 and genetic and the people

NOTE Confidence: 0.893695270869565

00:35:09.230 --> 00:35:11.788 who come into this group.

NOTE Confidence: 0.893695270869565

00:35:11.790 --> 00:35:13.710 They know their field well,

NOTE Confidence: 0.893695270869565

00:35:13.710 --> 00:35:15.468 but neuro psychologists who come in

NOTE Confidence: 0.893695270869565

00:35:15.468 --> 00:35:17.730 don't know a whole lot about genetics.

NOTE Confidence: 0.893695270869565

00:35:17.730 --> 00:35:19.300 Geneticists that come in don't

NOTE Confidence: 0.893695270869565

00:35:19.300 --> 00:35:21.530 know a whole lot about education,

NOTE Confidence: 0.893695270869565

00:35:21.530 --> 00:35:24.085 often not a whole lot about neuroimaging,

NOTE Confidence: 0.893695270869565

00:35:24.090 --> 00:35:25.740 so it's some very important and

NOTE Confidence: 0.893695270869565

00:35:25.740 --> 00:35:27.770 we really stress that we begin to

NOTE Confidence: 0.893695270869565

00:35:27.770 --> 00:35:29.225 learn each other's vocabulary that

NOTE Confidence: 0.893695270869565

00:35:29.225 --> 00:35:30.900 we really interact personally.

NOTE Confidence: 0.893695270869565

00:35:30.900 --> 00:35:32.760 Although this year it's been

NOTE Confidence: 0.893695270869565

00:35:32.760 --> 00:35:34.620 difficult to interact personally and

NOTE Confidence: 0.893695270869565

00:35:34.678 --> 00:35:36.596 so we can inform each other studies

NOTE Confidence: 0.893695270869565

00:35:36.596 --> 00:35:38.475 and help and work collaboratively

NOTE Confidence: 0.893695270869565

00:35:38.475 --> 00:35:40.459 collaboratively within the lab.

NOTE Confidence: 0.893695270869565

00:35:40.460 --> 00:35:42.056 And I think we've been pretty successful.

NOTE Confidence: 0.893695270869565

00:35:42.060 --> 00:35:43.224 I think that's like,

NOTE Confidence: 0.893695270869565

00:35:43.224 --> 00:35:43.806 for example,

NOTE Confidence: 0.893695270869565

00:35:43.810 --> 00:35:45.340 the study I presented from the

NOTE Confidence: 0.893695270869565

00:35:45.340 --> 00:35:46.360 Haven election on project.

NOTE Confidence: 0.893695270869565

00:35:46.360 --> 00:35:49.752 You can see that's a combined effort from

NOTE Confidence: 0.893695270869565

00:35:49.752 --> 00:35:51.520 neuropsychologist geneticist Biostatistics.

NOTE Confidence: 0.893695270869565

00:35:51.520 --> 00:35:53.095 I didn't show you the neuroimaging data,

NOTE Confidence: 0.893695270869565

00:35:53.100 --> 00:35:55.620 but it's remarkable how well that works and

NOTE Confidence: 0.893695270869565

00:35:55.620 --> 00:35:58.265 now we're moving into education with a PhD,

NOTE Confidence: 0.893695270869565

00:35:58.270 --> 00:35:58.650 PhD,

NOTE Confidence: 0.893695270869565

00:35:58.650 --> 00:36:01.310 postdoc in education recently joined the lab.

NOTE Confidence: 0.893695270869565

00:36:01.310 --> 00:36:02.805 So these are great initiatives

NOTE Confidence: 0.893695270869565

00:36:02.805 --> 00:36:04.733 and show how we're really blurring

NOTE Confidence: 0.893695270869565

00:36:04.733 --> 00:36:06.977 all the lines amongst all these

NOTE Confidence: 0.893695270869565

00:36:06.977 --> 00:36:07.725 different disciplines.

NOTE Confidence: 0.893695270869565

00:36:07.730 --> 00:36:10.005 But we're also trying to go cross

NOTE Confidence: 0.893695270869565

00:36:10.005 --> 00:36:11.984 campus and reach out and bridge

NOTE Confidence: 0.893695270869565

00:36:11.984 --> 00:36:14.168 the gap to other schools to other

NOTE Confidence: 0.893695270869565

00:36:14.236 --> 00:36:16.476 students and the other professional

NOTE Confidence: 0.893695270869565

00:36:16.476 --> 00:36:18.268 schools in the university.

NOTE Confidence: 0.893695270869565

00:36:18.270 --> 00:36:20.223 So I'm especially proud to say that

NOTE Confidence: 0.893695270869565

00:36:20.223 --> 00:36:22.384 we've been working with the folks at

NOTE Confidence: 0.893695270869565

00:36:22.384 --> 00:36:23.964 the Yale Educational Studies program,

NOTE Confidence: 0.893695270869565

00:36:23.970 --> 00:36:26.634 and we'll be offering a A1

NOTE Confidence: 0.893695270869565

00:36:26.634 --> 00:36:27.966 semester long course,

NOTE Confidence: 0.893695270869565

00:36:27.970 --> 00:36:29.419 mostly for undergraduates

NOTE Confidence: 0.893695270869565

00:36:29.419 --> 00:36:30.868 beginning this fall.

NOTE Confidence: 0.893695270869565

00:36:30.870 --> 00:36:32.838 This is the first course that they've been.

NOTE Confidence: 0.893695270869565

00:36:32.840 --> 00:36:34.925 Offering on learning disabilities and

NOTE Confidence: 0.893695270869565

00:36:34.925 --> 00:36:37.470 it's a full I think it's 17 lectures

NOTE Confidence: 0.893695270869565

00:36:37.470 --> 00:36:39.320 over the course of the semester,

NOTE Confidence: 0.893695270869565

00:36:39.320 --> 00:36:41.390 so this is developed by the

NOTE Confidence: 0.893695270869565

00:36:41.390 --> 00:36:44.058 folks in our in our group most.

NOTE Confidence: 0.893695270869565

00:36:44.060 --> 00:36:45.785 There's no Lee,

NOTE Confidence: 0.893695270869565

00:36:45.785 --> 00:36:48.660 Kim Tsujimoto and John Boston,

NOTE Confidence: 0.893695270869565

00:36:48.660 --> 00:36:50.676 and so they're prepared to present this.

NOTE Confidence: 0.893695270869565

00:36:50.680 --> 00:36:52.874 It is currently under review, but it's it's.

NOTE Confidence: 0.893695270869565

00:36:52.874 --> 00:36:54.820 It looks like it's going to start

NOTE Confidence: 0.943655927692308

00:36:54.884 --> 00:36:56.868 in the fall. We work really strongly

NOTE Confidence: 0.943655927692308

00:36:56.868 --> 00:36:58.800 with the folks in the computational

NOTE Confidence: 0.943655927692308

00:36:58.864 --> 00:37:00.778 biology and bio for Mattix program,

NOTE Confidence: 0.943655927692308

00:37:00.780 --> 00:37:02.826 but they have members from those

NOTE Confidence: 0.943655927692308

00:37:02.826 --> 00:37:05.181 programs in our lab and plus we

NOTE Confidence: 0.943655927692308

00:37:05.181 --> 00:37:07.337 present to them on a regular basis.

NOTE Confidence: 0.943655927692308

00:37:07.340 --> 00:37:09.368 This is a really extraordinary new

NOTE Confidence: 0.943655927692308

00:37:09.368 --> 00:37:12.109 program here at the School of Management.

NOTE Confidence: 0.943655927692308

00:37:12.110 --> 00:37:14.367 It's called the broad center or

NOTE Confidence: 0.943655927692308

00:37:14.367 --> 00:37:16.152 the Broad Center for Educational

NOTE Confidence: 0.943655927692308

00:37:16.152 --> 00:37:17.580 Leadership and Public Education.

NOTE Confidence: 0.943655927692308

00:37:17.580 --> 00:37:19.120 It's a brand new initiative.

NOTE Confidence: 0.943655927692308

00:37:19.120 --> 00:37:21.088 I think there are about a dozen broad

NOTE Confidence: 0.943655927692308

00:37:21.088 --> 00:37:22.838 Centers for this across the country.

NOTE Confidence: 0.943655927692308

00:37:22.840 --> 00:37:24.340 It was just started this past

NOTE Confidence: 0.943655927692308

00:37:24.340 --> 00:37:25.774 fall that brings in educational

NOTE Confidence: 0.943655927692308

00:37:25.774 --> 00:37:27.649 leaders from around the country.

NOTE Confidence: 0.943655927692308

00:37:27.650 --> 00:37:29.535 These are superintendents and school

NOTE Confidence: 0.943655927692308

00:37:29.535 --> 00:37:31.995 principals in the largest districts in the

NOTE Confidence: 0.943655927692308

00:37:31.995 --> 00:37:34.398 United States and they engage in a yearlong,

NOTE Confidence: 0.943655927692308

00:37:34.400 --> 00:37:35.480 transformative leadership

NOTE Confidence: 0.943655927692308

00:37:35.480 --> 00:37:37.640 program in public education.

NOTE Confidence: 0.943655927692308

00:37:37.640 --> 00:37:39.446 And so we're in contact and we're

NOTE Confidence: 0.943655927692308

00:37:39.446 --> 00:37:40.970 working with these folks as well.

NOTE Confidence: 0.943655927692308

00:37:40.970 --> 00:37:41.834 And then finally,

NOTE Confidence: 0.943655927692308

00:37:41.834 --> 00:37:42.410 of course,

NOTE Confidence: 0.943655927692308

00:37:42.410 --> 00:37:44.222 we're based here in the Department

NOTE Confidence: 0.943655927692308

00:37:44.222 --> 00:37:45.430 of Pediatrics and Genetics,

NOTE Confidence: 0.943655927692308

00:37:45.430 --> 00:37:47.880 where which is our home base and

NOTE Confidence: 0.943655927692308

00:37:47.880 --> 00:37:50.584 where we're going to also be reaching

NOTE Confidence: 0.943655927692308

00:37:50.584 --> 00:37:52.564 out to residents and hopefully.

NOTE Confidence: 0.943655927692308

00:37:52.570 --> 00:37:54.270 Increase the exposure they're

NOTE Confidence: 0.943655927692308

00:37:54.270 --> 00:37:55.970 having to learning disabilities

NOTE Confidence: 0.943655927692308

00:37:55.970 --> 00:37:57.877 that they're going to encounter

NOTE Confidence: 0.943655927692308

00:37:57.877 --> 00:37:59.869 when they enter practice as well,

NOTE Confidence: 0.943655927692308

00:37:59.870 --> 00:38:02.458 'cause it's so common.

NOTE Confidence: 0.943655927692308

00:38:02.460 --> 00:38:04.854 So this is our Yale program for

NOTE Confidence: 0.943655927692308

00:38:04.854 --> 00:38:05.880 Learning Disabilities Research.

NOTE Confidence: 0.943655927692308

00:38:05.880 --> 00:38:08.384 Its comprehensive, it's large,

NOTE Confidence: 0.943655927692308

00:38:08.384 --> 00:38:09.636 it's ambitious.

NOTE Confidence: 0.943655927692308

00:38:09.640 --> 00:38:12.335 We just got started this past September.

NOTE Confidence: 0.943655927692308

00:38:12.340 --> 00:38:13.780 These are the different components

NOTE Confidence: 0.943655927692308

00:38:13.780 --> 00:38:15.480 I tried to present to you,

NOTE Confidence: 0.943655927692308

00:38:15.480 --> 00:38:17.538 and with that I'm happy to take

NOTE Confidence: 0.943655927692308

00:38:17.538 --> 00:38:19.644 questions and also a big shout out

NOTE Confidence: 0.943655927692308

00:38:19.644 --> 00:38:21.378 to all these wonderful people who

NOTE Confidence: 0.943655927692308

00:38:21.437 --> 00:38:23.555 make this sort of research possible,

NOTE Confidence: 0.943655927692308

00:38:23.560 --> 00:38:25.744 as well as our funding groups

NOTE Confidence: 0.943655927692308

00:38:25.744 --> 00:38:26.836 from private foundations,

NOTE Confidence: 0.943655927692308

00:38:26.840 --> 00:38:28.465 them and foundations to the

NOTE Confidence: 0.943655927692308

00:38:28.465 --> 00:38:31.040 NIH as well as to individuals.

NOTE Confidence: 0.943655927692308

00:38:31.040 --> 00:38:32.608 And of course, thanks to all the children.

NOTE Confidence: 0.943655927692308

00:38:32.610 --> 00:38:34.482 Families who participated in

NOTE Confidence: 0.943655927692308

00:38:34.482 --> 00:38:35.886 all these studies.

NOTE Confidence: 0.943655927692308

00:38:35.890 --> 00:38:37.230 So if there are questions,

NOTE Confidence: 0.943655927692308

00:38:37.230 --> 00:38:38.160 I'm happy to take them.

NOTE Confidence: 0.906592701666667

00:38:43.700 --> 00:38:45.560 OK, Jeff, thank you so much.

NOTE Confidence: 0.906592701666667

00:38:45.560 --> 00:38:46.598 That was amazing.

NOTE Confidence: 0.906592701666667

00:38:46.598 --> 00:38:47.636 That was fantastic.

NOTE Confidence: 0.906592701666667

00:38:47.640 --> 00:38:49.220 Now we do have questions.

NOTE Confidence: 0.906592701666667

00:38:49.220 --> 00:38:51.628 I mean, I invite folks to submit

NOTE Confidence: 0.906592701666667

00:38:51.628 --> 00:38:53.837 questions via the chat or the Q&A,

NOTE Confidence: 0.906592701666667

00:38:53.840 --> 00:38:56.270 but we've got some questions already.

NOTE Confidence: 0.906592701666667

00:38:56.270 --> 00:38:58.346 Doctor Who in one of your

NOTE Confidence: 0.906592701666667

00:38:58.346 --> 00:38:59.730 earlier slides indicated that

NOTE Confidence: 0.906592701666667

00:38:59.797 --> 00:39:01.863 heritability for dyslexia is 0.80.

NOTE Confidence: 0.906592701666667

00:39:01.863 --> 00:39:03.681 How much of that is accounted

NOTE Confidence: 0.906592701666667

00:39:03.681 --> 00:39:06.078 for it by the SNP and Gary one?

NOTE Confidence: 0.906592701666667

00:39:06.080 --> 00:39:09.320 Is there a polygenic risk score for dyslexia?

NOTE Confidence: 0.906592701666667

00:39:09.320 --> 00:39:10.880 If so, how much variance?

NOTE Confidence: 0.906592701666667

00:39:10.880 --> 00:39:11.808 Does it account for?

NOTE Confidence: 0.928372473043478

00:39:12.060 --> 00:39:13.836 That's a great question.

NOTE Confidence: 0.928372473043478

00:39:13.836 --> 00:39:17.058 Thank you for asking so as clearly

NOTE Confidence: 0.928372473043478

00:39:17.058 --> 00:39:20.348 the you know Paul knows is that

NOTE Confidence: 0.928372473043478

00:39:20.348 --> 00:39:22.509 there's really two types of.

NOTE Confidence: 0.928372473043478

00:39:22.510 --> 00:39:24.890 Yeah, of variants that you can account

NOTE Confidence: 0.928372473043478

00:39:24.890 --> 00:39:27.110 for heritability that you can account for.

NOTE Confidence: 0.928372473043478

00:39:27.110 --> 00:39:28.922 There's broad sense heritability,

NOTE Confidence: 0.928372473043478

00:39:28.922 --> 00:39:31.187 and there's narrow sense heritability.

NOTE Confidence: 0.928372473043478

00:39:31.190 --> 00:39:33.894 When I say 80%, it's it's broad sense

NOTE Confidence: 0.928372473043478

00:39:33.894 --> 00:39:35.909 heritability that is when you look

NOTE Confidence: 0.928372473043478

00:39:35.909 --> 00:39:37.823 at twin studies and family studies,

NOTE Confidence: 0.928372473043478

00:39:37.830 --> 00:39:38.710 and then you see,

NOTE Confidence: 0.928372473043478

00:39:38.710 --> 00:39:40.030 and then you ask the question,

NOTE Confidence: 0.928372473043478

00:39:40.030 --> 00:39:42.340 what's the concordance rate between

NOTE Confidence: 0.928372473043478

00:39:42.340 --> 00:39:44.110 siblings who are affected, say,

NOTE Confidence: 0.928372473043478

00:39:44.110 --> 00:39:46.070 was reading disability in those that aren't,

NOTE Confidence: 0.928372473043478

00:39:46.070 --> 00:39:48.380 and you compare them the the classic

NOTE Confidence: 0.928372473043478

00:39:48.380 --> 00:39:50.232 example would be identical twins

NOTE Confidence: 0.928372473043478

00:39:50.232 --> 00:39:52.624 which share 100% of their genome.

NOTE Confidence: 0.928372473043478

00:39:52.624 --> 00:39:54.614 The concordance rate there versus

NOTE Confidence: 0.928372473043478

00:39:54.614 --> 00:39:56.508 the concordance rates and non

NOTE Confidence: 0.928372473043478

00:39:56.508 --> 00:39:58.228 identical twins which only share

NOTE Confidence: 0.928372473043478

00:39:58.228 --> 00:40:00.220 on average about 50% and so if

NOTE Confidence: 0.928372473043478

00:40:00.220 --> 00:40:01.920 you do those sorts of those are.

NOTE Confidence: 0.928372473043478

00:40:01.920 --> 00:40:03.595 Those are standard heritability studies

NOTE Confidence: 0.928372473043478

00:40:03.595 --> 00:40:07.126 in the 1980s and they would say that

NOTE Confidence: 0.928372473043478

00:40:07.126 --> 00:40:10.000 the genetic component is about 80%.

NOTE Confidence: 0.928372473043478

00:40:10.000 --> 00:40:13.598 There has been a polygenic risk score.

NOTE Confidence: 0.928372473043478

00:40:13.600 --> 00:40:16.664 Publication from Robert Plomin's

NOTE Confidence: 0.928372473043478

00:40:16.664 --> 00:40:19.016 group from the UK.

NOTE Confidence: 0.928372473043478

00:40:19.016 --> 00:40:21.872 He has the largest collection of twins,

NOTE Confidence: 0.928372473043478

00:40:21.880 --> 00:40:24.008 I think in probably the largest one is

NOTE Confidence: 0.928372473043478

00:40:24.008 --> 00:40:26.056 in Australia but he has the largest

NOTE Confidence: 0.928372473043478

00:40:26.056 --> 00:40:27.516 one that was reading assessments.

NOTE Confidence: 0.928372473043478

00:40:27.520 --> 00:40:29.634 I think it's 10,000 twins and he

NOTE Confidence: 0.928372473043478

00:40:29.634 --> 00:40:31.875 was able to account for all snips

NOTE Confidence: 0.928372473043478

00:40:31.875 --> 00:40:34.182 that he looked at and he looked

NOTE Confidence: 0.928372473043478

00:40:34.182 --> 00:40:35.897 at a genome wide panel.

NOTE Confidence: 0.928372473043478

00:40:35.900 --> 00:40:38.140 I think about 700,000 snips.

NOTE Confidence: 0.928372473043478

00:40:38.140 --> 00:40:40.252 He was able to account for

NOTE Confidence: 0.928372473043478

00:40:40.252 --> 00:40:42.274 about 8% of the heritability.

NOTE Confidence: 0.928372473043478

00:40:42.274 --> 00:40:44.026 This is pretty common

NOTE Confidence: 0.928372473043478

00:40:44.026 --> 00:40:45.340 for polygenic disorders.

NOTE Confidence: 0.928372473043478

00:40:45.340 --> 00:40:48.090 That is that even if you look at cancer etc

NOTE Confidence: 0.928372473043478

00:40:48.156 --> 00:40:50.780 etc etc and just look at common variants,

NOTE Confidence: 0.928372473043478

00:40:50.780 --> 00:40:53.168 which is what's represented and a

NOTE Confidence: 0.928372473043478

00:40:53.168 --> 00:40:54.760 single nucleotide polymorphism panel,

NOTE Confidence: 0.928372473043478

00:40:54.760 --> 00:40:56.854 you generally there's a huge gap

NOTE Confidence: 0.928372473043478

00:40:56.854 --> 00:40:58.250 between broad sense heritability

NOTE Confidence: 0.928372473043478

00:40:58.308 --> 00:40:59.920 and narrow sense heritability.

NOTE Confidence: 0.928372473043478

00:40:59.920 --> 00:41:01.624 Now, to answer you Paul direct

NOTE Confidence: 0.928372473043478

00:41:01.624 --> 00:41:02.845 your question directly, Paul,

NOTE Confidence: 0.928372473043478

00:41:02.845 --> 00:41:05.400 if you look at any single snip,

NOTE Confidence: 0.928372473043478

00:41:05.400 --> 00:41:07.236 you're looking only at a fraction

NOTE Confidence: 0.928372473043478

00:41:07.236 --> 00:41:08.939 of the heritability that is Gary.

NOTE Confidence: 0.928372473043478

00:41:08.940 --> 00:41:11.838 One explains only a tiny amount,

NOTE Confidence: 0.928372473043478

00:41:11.840 --> 00:41:12.980 so all that's why.

NOTE Confidence: 0.928372473043478

00:41:12.980 --> 00:41:15.619 And I didn't get into it on this talk,

NOTE Confidence: 0.928372473043478

00:41:15.620 --> 00:41:16.628 but in previous.

NOTE Confidence: 0.928372473043478

00:41:16.628 --> 00:41:18.980 Oxide, I mentioned it is that is

NOTE Confidence: 0.928372473043478

00:41:19.049 --> 00:41:21.449 that dyslexia language acquisition,

NOTE Confidence: 0.928372473043478

00:41:21.450 --> 00:41:22.698 language impairment,

NOTE Confidence: 0.928372473043478

00:41:22.698 --> 00:41:24.570 verbal trait disorder,

NOTE Confidence: 0.928372473043478

00:41:24.570 --> 00:41:24.982 dyscalculia,

NOTE Confidence: 0.928372473043478

00:41:24.982 --> 00:41:27.866 or the all these are polygenic disorders.

NOTE Confidence: 0.928372473043478

00:41:27.870 --> 00:41:30.243 You have to be lucky enough to

NOTE Confidence: 0.928372473043478

00:41:30.243 --> 00:41:32.280 have the smorgasbord of the right

NOTE Confidence: 0.928372473043478

00:41:32.280 --> 00:41:34.182 variants all at once for that.

NOTE Confidence: 0.928372473043478

00:41:34.190 --> 00:41:35.330 For that to happen,

NOTE Confidence: 0.928372473043478

00:41:35.330 --> 00:41:37.670 it is rarely a single gene disorder,

NOTE Confidence: 0.928372473043478

00:41:37.670 --> 00:41:39.755 although we have been looking

NOTE Confidence: 0.928372473043478

00:41:39.755 --> 00:41:41.006 at rare variants,

NOTE Confidence: 0.928372473043478

00:41:41.010 --> 00:41:42.626 and it does occur from time to time.

NOTE Confidence: 0.928372473043478

00:41:42.630 --> 00:41:43.988 None of them are in Gary want.

NOTE Confidence: 0.86906148125

00:41:46.560 --> 00:41:48.456 Thank you Jeff. A much more general question.

NOTE Confidence: 0.86906148125

00:41:48.460 --> 00:41:50.324 How did you become involved in this research?

NOTE Confidence: 0.71649926975

00:41:52.040 --> 00:41:57.528 Uh. So. Most people think that you know,

NOTE Confidence: 0.71649926975

00:41:57.530 --> 00:41:58.950 Jeff. He's a pediatrician,

NOTE Confidence: 0.71649926975

00:41:58.950 --> 00:42:01.080 and so he cares about children

NOTE Confidence: 0.71649926975

00:42:01.143 --> 00:42:03.453 and he cares about reading and he

NOTE Confidence: 0.71649926975

00:42:03.453 --> 00:42:05.380 got somehow seduced into genetics.

NOTE Confidence: 0.71649926975

00:42:05.380 --> 00:42:07.920 But actually it's the opposite.

NOTE Confidence: 0.71649926975

00:42:07.920 --> 00:42:09.560 And yes, I'm a pediatrician.

NOTE Confidence: 0.71649926975

00:42:09.560 --> 00:42:10.960 Yes, I care about children.

NOTE Confidence: 0.71649926975

00:42:10.960 --> 00:42:12.480 Yes, I care about reading,

NOTE Confidence: 0.71649926975

00:42:12.480 --> 00:42:15.432 but the way I got in was during

NOTE Confidence: 0.71649926975

00:42:15.432 --> 00:42:17.359 fellowship with with you Mark,

NOTE Confidence: 0.71649926975

00:42:17.360 --> 00:42:18.516 I actually got first.

NOTE Confidence: 0.71649926975

00:42:18.516 --> 00:42:20.897 Initially I was in cell biology and then

NOTE Confidence: 0.71649926975

00:42:20.897 --> 00:42:22.955 I got seduced over to molecular genetics

NOTE Confidence: 0.71649926975

00:42:22.955 --> 00:42:24.950 just at the time of the beginnings.

NOTE Confidence: 0.71649926975

00:42:24.950 --> 00:42:26.750 Of the Human Genome Project,

NOTE Confidence: 0.71649926975

00:42:26.750 --> 00:42:27.490 and I thought, you know,

NOTE Confidence: 0.71649926975

00:42:27.490 --> 00:42:29.428 this is a pretty cool thing,

NOTE Confidence: 0.71649926975

00:42:29.430 --> 00:42:31.293 and so I ended up in a lab that

NOTE Confidence: 0.71649926975

00:42:31.293 --> 00:42:32.806 does that was really pioneering

NOTE Confidence: 0.71649926975

00:42:32.806 --> 00:42:35.057 many of the methods for the human

NOTE Confidence: 0.71649926975

00:42:35.057 --> 00:42:36.687 Genome project and my first.

NOTE Confidence: 0.71649926975

00:42:36.690 --> 00:42:39.250 This was insuring Weismans lab here at Yale,

NOTE Confidence: 0.71649926975

00:42:39.250 --> 00:42:41.500 and at that time what we were doing is

NOTE Confidence: 0.71649926975

00:42:41.500 --> 00:42:43.568 remember there is no human genome project.

NOTE Confidence: 0.71649926975

00:42:43.570 --> 00:42:45.166 It was just starting off the ground.

NOTE Confidence: 0.71649926975

00:42:45.170 --> 00:42:46.555 Nobody really knew how to

NOTE Confidence: 0.71649926975

00:42:46.555 --> 00:42:47.663 clone the human genome,

NOTE Confidence: 0.71649926975

00:42:47.670 --> 00:42:48.990 and so one of my early

NOTE Confidence: 0.71649926975

00:42:48.990 --> 00:42:49.870 projects was the clone.

NOTE Confidence: 0.71649926975

00:42:49.870 --> 00:42:52.084 The short arm of chromosome 6 and then one

NOTE Confidence: 0.71649926975

00:42:52.084 --> 00:42:54.517 day Sherm came up to me and said, Jeff,

NOTE Confidence: 0.71649926975

00:42:54.517 --> 00:42:57.919 why do you clone the hemochromatosis?

NOTE Confidence: 0.71649926975

00:42:57.920 --> 00:42:59.720 And of course, I said sure you know,

NOTE Confidence: 0.71649926975

00:42:59.720 --> 00:43:00.632 I'm a pediatrician,

NOTE Confidence: 0.71649926975

00:43:00.632 --> 00:43:02.152 I don't really know very

NOTE Confidence: 0.71649926975

00:43:02.152 --> 00:43:03.700 much about hemochromatosis.

NOTE Confidence: 0.71649926975

00:43:03.700 --> 00:43:06.676 It sounds like a disease of adults and

NOTE Confidence: 0.71649926975

00:43:06.676 --> 00:43:08.300 Alcoholics, and he goes no, no, no you.

NOTE Confidence: 0.71649926975

00:43:08.300 --> 00:43:10.040 We we've known that it's genetic

NOTE Confidence: 0.71649926975

00:43:10.040 --> 00:43:11.320 for a long time,

NOTE Confidence: 0.71649926975

00:43:11.320 --> 00:43:13.100 and you've already cloned it.

NOTE Confidence: 0.71649926975

00:43:13.100 --> 00:43:14.945 It's one of your one of your 6 or

NOTE Confidence: 0.71649926975

00:43:14.945 --> 00:43:16.880 7000 tubes you have in your freezer,

NOTE Confidence: 0.71649926975

00:43:16.880 --> 00:43:19.094 so just go figure out which one it was,

NOTE Confidence: 0.71649926975

00:43:19.100 --> 00:43:20.836 and so that's how it got started.

NOTE Confidence: 0.71649926975

00:43:20.840 --> 00:43:22.772 We got scooped by a private

NOTE Confidence: 0.71649926975

00:43:22.772 --> 00:43:24.060 company several years later,

NOTE Confidence: 0.71649926975

00:43:24.060 --> 00:43:25.830 but I had all these resources

NOTE Confidence: 0.71649926975

00:43:25.830 --> 00:43:26.715 for chromosome 6.

NOTE Confidence: 0.71649926975

00:43:26.720 --> 00:43:29.480 I looked around and there was this locus.

NOTE Confidence: 0.71649926975

00:43:29.480 --> 00:43:31.867 There was this location of a strong

NOTE Confidence: 0.71649926975

00:43:31.867 --> 00:43:33.887 genetic effect on the short arm

NOTE Confidence: 0.71649926975

00:43:33.887 --> 00:43:35.724 of chromosome 6 for which I was,

NOTE Confidence: 0.71649926975

00:43:35.724 --> 00:43:36.176 I think,

NOTE Confidence: 0.71649926975

00:43:36.180 --> 00:43:38.052 at that time probably the only

NOTE Confidence: 0.71649926975

00:43:38.052 --> 00:43:40.003 person in the universe who actually

NOTE Confidence: 0.71649926975

00:43:40.003 --> 00:43:41.593 had complete coverage in new

NOTE Confidence: 0.71649926975

00:43:41.593 --> 00:43:43.379 were all the markers were,

NOTE Confidence: 0.71649926975

00:43:43.380 --> 00:43:44.946 and that's how I got started.

NOTE Confidence: 0.71649926975

00:43:44.950 --> 00:43:47.740 And so the truth is, yes, I'm Peter, Trish.

NOTE Confidence: 0.71649926975

00:43:47.740 --> 00:43:49.405 And yes, I practice medicine.

NOTE Confidence: 0.71649926975

00:43:49.405 --> 00:43:50.980 Yes, I care about children.

NOTE Confidence: 0.71649926975

00:43:50.980 --> 00:43:52.112 I care about reading,

NOTE Confidence: 0.71649926975

00:43:52.112 --> 00:43:54.127 but the reason I really jumped into

NOTE Confidence: 0.71649926975

00:43:54.127 --> 00:43:55.933 this is 'cause I had a strategic,

NOTE Confidence: 0.71649926975

00:43:55.940 --> 00:43:56.822 scientific advantage.

NOTE Confidence: 0.71649926975

00:43:56.822 --> 00:43:59.468 And I took advantage of it.

NOTE Confidence: 0.912666885

00:44:01.390 --> 00:44:05.100 Thank you. From Steve uptegrove.

NOTE Confidence: 0.912666885

00:44:05.100 --> 00:44:06.685 He even has, unfortunately a well

NOTE Confidence: 0.912666885

00:44:06.685 --> 00:44:08.496 known history for a high prevalence

NOTE Confidence: 0.912666885

00:44:08.496 --> 00:44:10.335 of childhood lead poisoning while

NOTE Confidence: 0.912666885

00:44:10.335 --> 00:44:11.910 childhood lead exposure is supposed

NOTE Confidence: 0.912666885

00:44:11.910 --> 00:44:14.179 to be documented on all children PE

NOTE Confidence: 0.912666885

00:44:14.179 --> 00:44:16.075 forms upon school entry in Connecticut.

NOTE Confidence: 0.912666885

00:44:16.080 --> 00:44:18.418 This information is not routinely been used

NOTE Confidence: 0.912666885

00:44:18.418 --> 00:44:21.043 to identify those at high risk for the

NOTE Confidence: 0.912666885

00:44:21.043 --> 00:44:22.940 same disabilities you were concerned with.

NOTE Confidence: 0.912666885

00:44:22.940 --> 00:44:24.632 Rather, they come to the light

NOTE Confidence: 0.912666885

00:44:24.632 --> 00:44:26.720 only by the same weight to fail,

NOTE Confidence: 0.912666885

00:44:26.720 --> 00:44:29.240 model the wait to fail model you mentioned.

NOTE Confidence: 0.912666885

00:44:29.240 --> 00:44:30.944 What has been lacking are the

NOTE Confidence: 0.912666885

00:44:30.944 --> 00:44:32.538 resources in schools for particularly

NOTE Confidence: 0.912666885

00:44:32.538 --> 00:44:34.541 districts like New Haven, Kubara,

NOTE Confidence: 0.912666885

00:44:34.541 --> 00:44:37.348 Heavy burden of potentially at risk hits.

NOTE Confidence: 0.836971998

00:44:39.100 --> 00:44:40.840 Steven, that's a great question.

NOTE Confidence: 0.836971998

00:44:40.840 --> 00:44:42.820 First of all, I want to tell and just,

NOTE Confidence: 0.836971998

00:44:42.820 --> 00:44:45.004 you know, reach out to Steve is that

NOTE Confidence: 0.836971998

00:44:45.004 --> 00:44:47.088 when we first started our studies

NOTE Confidence: 0.836971998

00:44:47.088 --> 00:44:49.290 here in New Haven Public Schools,

NOTE Confidence: 0.836971998

00:44:49.290 --> 00:44:51.480 Steven was one of the earliest

NOTE Confidence: 0.836971998

00:44:51.480 --> 00:44:53.935 persons that I reached out to because

NOTE Confidence: 0.836971998

00:44:53.935 --> 00:44:56.098 I think at that time Steve you

NOTE Confidence: 0.836971998

00:44:56.176 --> 00:44:57.902 were either on New Haven School,

NOTE Confidence: 0.836971998

00:44:57.902 --> 00:45:00.037 you were on the school board or you

NOTE Confidence: 0.836971998

00:45:00.037 --> 00:45:01.819 add connections to the school board.

NOTE Confidence: 0.836971998

00:45:01.820 --> 00:45:03.800 And so you were one of the first people

NOTE Confidence: 0.836971998

00:45:03.800 --> 00:45:05.798 and you were wonderful and I greatly

NOTE Confidence: 0.836971998

00:45:05.798 --> 00:45:07.534 appreciate all the help that you

NOTE Confidence: 0.836971998

00:45:07.534 --> 00:45:09.403 offered and all the advice that would.

NOTE Confidence: 0.836971998

00:45:09.410 --> 00:45:11.606 Proved to be very, very useful.

NOTE Confidence: 0.836971998

00:45:11.610 --> 00:45:14.858 Second of all is that I'm not

NOTE Confidence: 0.836971998

00:45:14.858 --> 00:45:16.574 discounting the environmental exposures,

NOTE Confidence: 0.836971998

00:45:16.574 --> 00:45:19.166 they're huge and and they're a big deal,

NOTE Confidence: 0.836971998

00:45:19.170 --> 00:45:21.725 and they are certainly a big deal

NOTE Confidence: 0.836971998

00:45:21.725 --> 00:45:23.310 to different socioeconomic groups.

NOTE Confidence: 0.836971998

00:45:23.310 --> 00:45:26.054 I can't answer your your your excellent

NOTE Confidence: 0.836971998

00:45:26.054 --> 00:45:27.959 question directly because that would

NOTE Confidence: 0.836971998

00:45:27.959 --> 00:45:30.283 that would require is probably you know

NOTE Confidence: 0.836971998

00:45:30.283 --> 00:45:32.846 more lead testing and more documentation,

NOTE Confidence: 0.836971998

00:45:32.850 --> 00:45:34.866 but what I can say is that we've

NOTE Confidence: 0.836971998

00:45:34.866 --> 00:45:37.477 begun as part of the Yale Program

NOTE Confidence: 0.836971998

00:45:37.477 --> 00:45:39.113 for Learning Disabilities Research.

NOTE Confidence: 0.836971998

00:45:39.120 --> 00:45:41.794 We've begun a formal program to look

NOTE Confidence: 0.836971998

00:45:41.794 --> 00:45:44.179 at the electronic medical record we

NOTE Confidence: 0.836971998

00:45:44.179 --> 00:45:46.513 started looking at by just looking

NOTE Confidence: 0.836971998

00:45:46.513 --> 00:45:49.307 at coding for learning disabilities.

NOTE Confidence: 0.836971998

00:45:49.310 --> 00:45:51.524 And we we're doing this project

NOTE Confidence: 0.836971998

00:45:51.524 --> 00:45:53.000 collaboratively with Emily Power,

NOTE Confidence: 0.836971998

00:45:53.000 --> 00:45:55.320 so so I think we're just starting to

NOTE Confidence: 0.836971998

00:45:55.320 --> 00:45:57.759 get the data at interesting enough.

NOTE Confidence: 0.836971998

00:45:57.760 --> 00:45:58.492 Interestingly enough,

NOTE Confidence: 0.836971998

00:45:58.492 --> 00:46:00.322 we're probably looking right now

NOTE Confidence: 0.836971998

00:46:00.322 --> 00:46:02.620 at about 40,000 kids in total,

NOTE Confidence: 0.836971998

00:46:02.620 --> 00:46:04.960 and amongst the 40,000 kids there.

NOTE Confidence: 0.836971998

00:46:04.960 --> 00:46:07.102 We're looking for codes that would at

NOTE Confidence: 0.836971998

00:46:07.102 --> 00:46:09.130 least implicate some learning disability.

NOTE Confidence: 0.836971998

00:46:09.130 --> 00:46:11.026 From there, we'll go on and that is.

NOTE Confidence: 0.836971998

00:46:11.030 --> 00:46:12.745 We'll try and peel the onion and

NOTE Confidence: 0.836971998

00:46:12.745 --> 00:46:13.830 get to be well.

NOTE Confidence: 0.836971998

00:46:13.830 --> 00:46:15.055 What is the real learning

NOTE Confidence: 0.836971998

00:46:15.055 --> 00:46:16.450 disabilities that they have could be?

NOTE Confidence: 0.836971998

00:46:16.450 --> 00:46:18.310 They could? Could they be overcoated?

NOTE Confidence: 0.836971998

00:46:18.310 --> 00:46:19.081 Could be undercoated,

NOTE Confidence: 0.836971998

00:46:19.081 --> 00:46:20.880 but one of the things that we

NOTE Confidence: 0.836971998

00:46:20.933 --> 00:46:22.715 will definitely look look for now

NOTE Confidence: 0.836971998

00:46:22.715 --> 00:46:23.903 that you've mentioned it.

NOTE Confidence: 0.836971998

00:46:23.910 --> 00:46:25.611 And thank you for asking is we'll

NOTE Confidence: 0.836971998

00:46:25.611 --> 00:46:27.817 look at lead levels 'cause we can do

NOTE Confidence: 0.836971998

00:46:27.817 --> 00:46:29.508 that in the electronic medical record

NOTE Confidence: 0.836971998

00:46:29.508 --> 00:46:31.407 and we'll try to see if that is a

NOTE Confidence: 0.836971998

00:46:31.410 --> 00:46:33.790 significant factor in these things.

NOTE Confidence: 0.836971998

00:46:33.790 --> 00:46:34.994 I suspect it is,

NOTE Confidence: 0.836971998

00:46:34.994 --> 00:46:36.800 but I also suspect there correlate

NOTE Confidence: 0.836971998

00:46:36.862 --> 00:46:38.930 strongly with socioeconomic status,

NOTE Confidence: 0.836971998

00:46:38.930 --> 00:46:40.538 which is something I didn't mention

NOTE Confidence: 0.836971998

00:46:40.538 --> 00:46:42.290 in the GWAS that I presented.

NOTE Confidence: 0.836971998

00:46:42.290 --> 00:46:44.782 But in that GWAS it is corrected

NOTE Confidence: 0.836971998

00:46:44.782 --> 00:46:45.850 for socioeconomic status.

NOTE Confidence: 0.836971998

00:46:45.850 --> 00:46:49.640 We always do that as well as sex and age,

NOTE Confidence: 0.836971998

00:46:49.640 --> 00:46:51.410 and so that's an important part.

NOTE Confidence: 0.836971998

00:46:51.410 --> 00:46:53.246 But I'm going to add lead to the list.

NOTE Confidence: 0.836971998

00:46:53.250 --> 00:46:54.558 I think that's a great question.

NOTE Confidence: 0.691039984

00:46:56.540 --> 00:46:58.200 Jeff from Jim Pelligrini Jeff.

NOTE Confidence: 0.691039984

00:46:58.200 --> 00:46:59.126 Truly amazing.

NOTE Confidence: 0.691039984

00:46:59.126 --> 00:47:00.978 You mentioned executive functioning.

NOTE Confidence: 0.691039984

00:47:00.980 --> 00:47:02.456 Any research at the genetic level.

NOTE Confidence: 0.691039984

00:47:02.460 --> 00:47:04.248 Here schizophrenics can have

NOTE Confidence: 0.691039984

00:47:04.248 --> 00:47:06.483 excellent verbal and reading skills,

NOTE Confidence: 0.691039984

00:47:06.490 --> 00:47:09.020 but severely poor executive function.

NOTE Confidence: 0.875898443846154

00:47:10.510 --> 00:47:13.205 No, I I've been very careful to

NOTE Confidence: 0.875898443846154

00:47:13.205 --> 00:47:15.950 stay away from the psychosis Jim.

NOTE Confidence: 0.875898443846154

00:47:15.950 --> 00:47:19.280 That's a that's a well populated

NOTE Confidence: 0.875898443846154

00:47:19.280 --> 00:47:22.400 field to be politically correct.

NOTE Confidence: 0.875898443846154

00:47:22.400 --> 00:47:25.210 And so I, you know, sort of stay in my

NOTE Confidence: 0.875898443846154

00:47:25.210 --> 00:47:27.276 lane and within within with children

NOTE Confidence: 0.875898443846154

00:47:27.276 --> 00:47:29.336 and typically and specifically.

NOTE Confidence: 0.875898443846154

00:47:29.340 --> 00:47:31.192 And typically developing children

NOTE Confidence: 0.875898443846154

00:47:31.192 --> 00:47:33.507 if you're not typically developing.

NOTE Confidence: 0.875898443846154

00:47:33.510 --> 00:47:35.925 That is, if you have a neuro

NOTE Confidence: 0.875898443846154

00:47:35.925 --> 00:47:37.570 psychosis or even autism.

NOTE Confidence: 0.875898443846154

00:47:37.570 --> 00:47:39.042 We've been excluding those

NOTE Confidence: 0.875898443846154

00:47:39.042 --> 00:47:40.514 children from our studies.

NOTE Confidence: 0.875898443846154

00:47:40.520 --> 00:47:42.992 Really trying to focus on those

NOTE Confidence: 0.875898443846154

00:47:42.992 --> 00:47:45.216 pathways and circuits that are

NOTE Confidence: 0.875898443846154

00:47:45.216 --> 00:47:47.208 specific for either reading

NOTE Confidence: 0.875898443846154

00:47:47.208 --> 00:47:49.200 language or executive function.

NOTE Confidence: 0.875898443846154

00:47:49.200 --> 00:47:50.745 Having said that,

NOTE Confidence: 0.875898443846154

00:47:50.745 --> 00:47:53.320 we have extensive executive function

NOTE Confidence: 0.875898443846154

00:47:53.320 --> 00:47:56.218 assessments on all 500 of our kids

NOTE Confidence: 0.875898443846154

00:47:56.218 --> 00:47:58.636 in our longitudinal study as well as

NOTE Confidence: 0.875898443846154

00:47:58.636 --> 00:48:00.746 the 1300 kids in our initial cross

NOTE Confidence: 0.875898443846154

00:48:00.746 --> 00:48:02.619 sectional study called the Grad study,

NOTE Confidence: 0.875898443846154

00:48:02.620 --> 00:48:04.555 and so we've actually performed

NOTE Confidence: 0.875898443846154

00:48:04.555 --> 00:48:07.460 our first juos and tiwas on that

NOTE Confidence: 0.875898443846154

00:48:07.460 --> 00:48:09.256 data specifically on attention,

NOTE Confidence: 0.875898443846154

00:48:09.260 --> 00:48:11.045 and I can tell you that our

NOTE Confidence: 0.875898443846154

00:48:11.045 --> 00:48:11.555 preliminary results.

NOTE Confidence: 0.875898443846154

00:48:11.560 --> 00:48:12.416 Look really,

NOTE Confidence: 0.875898443846154

00:48:12.416 --> 00:48:13.272 really good,

NOTE Confidence: 0.875898443846154

00:48:13.272 --> 00:48:16.230 so I think yes we will have some

NOTE Confidence: 0.875898443846154

00:48:16.230 --> 00:48:17.780 jeans and genetic variants that

NOTE Confidence: 0.875898443846154

00:48:17.780 --> 00:48:20.178 will correspond beautifully and and

NOTE Confidence: 0.875898443846154

00:48:20.178 --> 00:48:22.098 will identify risk for attention.

NOTE Confidence: 0.875898443846154

00:48:22.100 --> 00:48:23.772 I can tell you is that that there

NOTE Confidence: 0.875898443846154

00:48:23.772 --> 00:48:25.696 are a lot of good people in this

NOTE Confidence: 0.875898443846154

00:48:25.696 --> 00:48:27.345 field and a number of handful

NOTE Confidence: 0.875898443846154

00:48:27.345 --> 00:48:29.211 of genes for us specifically for

NOTE Confidence: 0.875898443846154

00:48:29.211 --> 00:48:30.528 attention have been identified,

NOTE Confidence: 0.875898443846154

00:48:30.528 --> 00:48:33.280 and so I think this is a very

NOTE Confidence: 0.875898443846154

00:48:33.355 --> 00:48:34.999 cool area of interest.

NOTE Confidence: 0.875898443846154

00:48:35.000 --> 00:48:37.110 We continue to pursue it

NOTE Confidence: 0.875898443846154

00:48:37.110 --> 00:48:39.360 and I'll keep you posted I.

NOTE Confidence: 0.875898443846154

00:48:39.360 --> 00:48:41.628 I think we'll have something solid.

NOTE Confidence: 0.875898443846154

00:48:41.630 --> 00:48:43.380 I'm hoping the manuscript will

NOTE Confidence: 0.875898443846154

00:48:43.380 --> 00:48:44.780 go out before June.

NOTE Confidence: 0.795384104

00:48:46.680 --> 00:48:49.380 Thanks Jeff from Julia Rosenberg.

NOTE Confidence: 0.795384104

00:48:49.380 --> 00:48:51.078 Thank you for a great talk.

NOTE Confidence: 0.795384104

00:48:51.080 --> 00:48:52.858 I'd love to learn if English language

NOTE Confidence: 0.795384104

00:48:52.858 --> 00:48:54.453 learners have been included in these

NOTE Confidence: 0.795384104

00:48:54.453 --> 00:48:56.198 studies in New Haven schools and if

NOTE Confidence: 0.795384104

00:48:56.198 --> 00:48:57.950 you have any insight into how some of

NOTE Confidence: 0.795384104

00:48:58.002 --> 00:48:59.885 these findings may factor in for those

NOTE Confidence: 0.795384104

00:48:59.885 --> 00:49:01.639 who are English language learners.

NOTE Confidence: 0.795384104

00:49:01.640 --> 00:49:02.888 Thank you. Hi

NOTE Confidence: 0.911747908571429

00:49:02.900 --> 00:49:05.735 Julia, so the short answer is yes,

NOTE Confidence: 0.911747908571429

00:49:05.740 --> 00:49:06.780 you know there are.

NOTE Confidence: 0.911747908571429

00:49:06.780 --> 00:49:09.396 So if you're going to be in New Haven

NOTE Confidence: 0.911747908571429

00:49:09.396 --> 00:49:11.276 public schools, you're going to be.

NOTE Confidence: 0.911747908571429

00:49:11.276 --> 00:49:12.796 You're going to have English

NOTE Confidence: 0.911747908571429

00:49:12.796 --> 00:49:14.576 language learners. So the.

NOTE Confidence: 0.911747908571429

00:49:14.576 --> 00:49:19.070 We for our initial study of the grad study,

NOTE Confidence: 0.911747908571429

00:49:19.070 --> 00:49:21.280 we required that so that

NOTE Confidence: 0.911747908571429

00:49:21.280 --> 00:49:23.490 was an older age group,

NOTE Confidence: 0.911747908571429

00:49:23.490 --> 00:49:26.410 so those kids were nine,

NOTE Confidence: 0.911747908571429

00:49:26.410 --> 00:49:27.486 roughly 9 years old,

NOTE Confidence: 0.911747908571429

00:49:27.486 --> 00:49:29.730 and we required that they have been at

NOTE Confidence: 0.911747908571429

00:49:29.730 --> 00:49:31.725 least three years in instruction in the

NOTE Confidence: 0.911747908571429

00:49:31.725 --> 00:49:33.545 United States to be in our studies.

NOTE Confidence: 0.911747908571429

00:49:33.550 --> 00:49:34.603 Remember that study?

NOTE Confidence: 0.911747908571429

00:49:34.603 --> 00:49:36.709 The grad study was the 1st,

NOTE Confidence: 0.911747908571429

00:49:36.710 --> 00:49:39.698 and remains the only study of

NOTE Confidence: 0.911747908571429

00:49:39.698 --> 00:49:41.192 underrepresented minorities of

NOTE Confidence: 0.911747908571429

00:49:41.192 --> 00:49:43.928 genetics and reading disability effort,

NOTE Confidence: 0.911747908571429

00:49:43.930 --> 00:49:46.216 and so, and we identified variants.

NOTE Confidence: 0.911747908571429

00:49:46.220 --> 00:49:48.212 Do that and publish variance through

NOTE Confidence: 0.911747908571429

00:49:48.212 --> 00:49:50.356 that and so that was for the grad

NOTE Confidence: 0.911747908571429

00:49:50.356 --> 00:49:52.760 studies in the haven next rental project.

NOTE Confidence: 0.911747908571429

00:49:52.760 --> 00:49:54.572 We didn't have much.

NOTE Confidence: 0.911747908571429

00:49:54.572 --> 00:49:56.837 Basically they could get by

NOTE Confidence: 0.911747908571429

00:49:56.837 --> 00:49:59.440 with a cursory understanding.

NOTE Confidence: 0.911747908571429

00:49:59.440 --> 00:50:02.094 In English we didn't.

NOTE Confidence: 0.911747908571429

00:50:02.094 --> 00:50:04.026 We didn't offer in the initial

NOTE Confidence: 0.911747908571429

00:50:04.026 --> 00:50:06.425 study the grad study we offered

NOTE Confidence: 0.911747908571429

00:50:06.425 --> 00:50:07.694 Spanish language testing.

NOTE Confidence: 0.911747908571429

00:50:07.700 --> 00:50:09.416 We actually, interestingly enough,

NOTE Confidence: 0.911747908571429

00:50:09.416 --> 00:50:11.990 we really see a difference between

NOTE Confidence: 0.911747908571429

00:50:12.057 --> 00:50:14.199 English and testing them in English

NOTE Confidence: 0.911747908571429

00:50:14.199 --> 00:50:16.280 or Spanish and the New Haven next.

NOTE Confidence: 0.911747908571429

00:50:16.280 --> 00:50:18.086 Project just about all the kids

NOTE Confidence: 0.911747908571429

00:50:18.086 --> 00:50:19.780 are pretty proficient in English,

NOTE Confidence: 0.911747908571429

00:50:19.780 --> 00:50:22.066 but it wasn't an exclusionary criteria.

NOTE Confidence: 0.762341128333333

00:50:24.440 --> 00:50:27.728 Thanks Jeff. Question from Susan Blvd.

NOTE Confidence: 0.762341128333333

00:50:27.730 --> 00:50:29.557 Do you know why New York and

NOTE Confidence: 0.762341128333333

00:50:29.557 --> 00:50:31.622 California were two of the states that

NOTE Confidence: 0.762341128333333

00:50:31.622 --> 00:50:33.147 were not doing dyslexia screening

NOTE Confidence: 0.762341128333333

00:50:33.147 --> 00:50:34.906 and any concerns that prenatal

NOTE Confidence: 0.762341128333333

00:50:34.906 --> 00:50:37.000 screening might be used to terminate.

NOTE Confidence: 0.762341128333333

00:50:37.000 --> 00:50:41.220 Quote non ideal End Quote babies so

NOTE Confidence: 0.9264122825

00:50:41.250 --> 00:50:43.130 I can't tell you about California New York.

NOTE Confidence: 0.9264122825

00:50:43.130 --> 00:50:46.220 Sorry but I do know that there that

NOTE Confidence: 0.9264122825

00:50:46.220 --> 00:50:47.237 they haven't passed legislation

NOTE Confidence: 0.9264122825

00:50:47.237 --> 00:50:48.609 yet for universal screening.

NOTE Confidence: 0.9264122825

00:50:48.610 --> 00:50:51.058 I suspect it has a lot to do with

NOTE Confidence: 0.9264122825

00:50:51.058 --> 00:50:53.220 money and so you know these are

NOTE Confidence: 0.9264122825

00:50:53.220 --> 00:50:54.705 expensive things, but I don't.

NOTE Confidence: 0.9264122825

00:50:54.705 --> 00:50:56.130 I don't know the specifics.

NOTE Confidence: 0.9264122825

00:50:56.130 --> 00:50:57.066 Regarding prenatal diagnosis,

NOTE Confidence: 0.9264122825

00:50:57.066 --> 00:50:58.938 I get this question a lot.

NOTE Confidence: 0.9264122825

00:50:58.940 --> 00:51:01.151 People find me, they call me and

NOTE Confidence: 0.9264122825

00:51:01.151 --> 00:51:03.319 this is what I tell them and it,

NOTE Confidence: 0.9264122825

00:51:03.320 --> 00:51:06.386 you know I I don't work

NOTE Confidence: 0.9264122825

00:51:06.386 --> 00:51:07.514 with children with dyslexia,

NOTE Confidence: 0.9264122825

00:51:07.520 --> 00:51:08.447 I'm a neonatologist,

NOTE Confidence: 0.9264122825

00:51:08.447 --> 00:51:11.055 but I my group does and and and

NOTE Confidence: 0.9264122825

00:51:11.055 --> 00:51:12.925 certainly I interact with people

NOTE Confidence: 0.9264122825

00:51:12.925 --> 00:51:15.787 from around the world that work with

NOTE Confidence: 0.9264122825

00:51:15.787 --> 00:51:17.519 children with reading disability

NOTE Confidence: 0.9264122825

00:51:17.520 --> 00:51:18.678 and they tell me two things.

NOTE Confidence: 0.9264122825

00:51:18.680 --> 00:51:21.158 Yes, they struggle.

NOTE Confidence: 0.9264122825

00:51:21.160 --> 00:51:22.945 And they also tell me that a

NOTE Confidence: 0.9264122825

00:51:22.945 --> 00:51:24.502 significant number of them have

NOTE Confidence: 0.9264122825

00:51:24.502 --> 00:51:25.966 other really significant talents.

NOTE Confidence: 0.9264122825

00:51:25.970 --> 00:51:26.526 For example,

NOTE Confidence: 0.9264122825

00:51:26.526 --> 00:51:28.194 there's a group that has told

NOTE Confidence: 0.9264122825

00:51:28.194 --> 00:51:29.964 me that about 20% this is,

NOTE Confidence: 0.9264122825

00:51:29.964 --> 00:51:32.253 and I've I've heard this from multiple

NOTE Confidence: 0.9264122825

00:51:32.253 --> 00:51:33.257 neuropsychologists that there's

NOTE Confidence: 0.9264122825

00:51:33.257 --> 00:51:35.117 probably somewhere between 10 and 20%

NOTE Confidence: 0.9264122825

00:51:35.120 --> 00:51:37.058 of kids with really severe dyslexia.

NOTE Confidence: 0.9264122825

00:51:37.060 --> 00:51:39.996 Have this special ability to be able to

NOTE Confidence: 0.9264122825

00:51:39.996 --> 00:51:42.787 see things in three dimensional space.

NOTE Confidence: 0.9264122825

00:51:42.790 --> 00:51:45.494 It's really a marvel of ability to do,

NOTE Confidence: 0.9264122825

00:51:45.500 --> 00:51:47.680 and so if you if you look at all these

NOTE Confidence: 0.9264122825

00:51:47.739 --> 00:51:49.429 examples of successes and people

NOTE Confidence: 0.9264122825

00:51:49.429 --> 00:51:51.700 who have had pretty severe dyslexia.

NOTE Confidence: 0.9264122825

00:51:51.700 --> 00:51:53.455 Done well business and academia

NOTE Confidence: 0.9264122825

00:51:53.455 --> 00:51:56.005 etc and they they have been tested

NOTE Confidence: 0.9264122825

00:51:56.005 --> 00:51:58.195 and they really do have dyslexia.

NOTE Confidence: 0.9264122825

00:51:58.200 --> 00:51:59.760 The question is why would you

NOTE Confidence: 0.9264122825

00:51:59.760 --> 00:52:00.800 want to exclude them?

NOTE Confidence: 0.9264122825

00:52:00.800 --> 00:52:02.205 Why would you want to

NOTE Confidence: 0.9264122825

00:52:02.205 --> 00:52:03.329 do an early termination?

NOTE Confidence: 0.9264122825

00:52:03.330 --> 00:52:06.364 So I do my very best to when people

NOTE Confidence: 0.9264122825

00:52:06.364 --> 00:52:08.513 call and I think I've been pretty

NOTE Confidence: 0.9264122825

00:52:08.513 --> 00:52:09.934 convincing is that this would

NOTE Confidence: 0.9264122825

00:52:09.934 --> 00:52:11.512 not be something that he won.

NOTE Confidence: 0.9264122825

00:52:11.520 --> 00:52:13.888 I would either test 4 or #2 recommend

NOTE Confidence: 0.9264122825

00:52:13.888 --> 00:52:16.593 that it be test four or certainly

NOTE Confidence: 0.9264122825

00:52:16.593 --> 00:52:18.225 predicated termination on because

NOTE Confidence: 0.9264122825

00:52:18.225 --> 00:52:20.418 it makes no sense whatsoever.

NOTE Confidence: 0.9264122825

00:52:20.420 --> 00:52:22.202 These kids are.

NOTE Confidence: 0.9264122825

00:52:22.202 --> 00:52:23.390 Are phenomenal,

NOTE Confidence: 0.9264122825

00:52:23.390 --> 00:52:25.352 and they turn into phenomenal adults

NOTE Confidence: 0.9264122825

00:52:25.352 --> 00:52:27.310 and incredibly happy and productive.

NOTE Confidence: 0.9264122825

00:52:27.310 --> 00:52:28.850 They work hard, they struggle.

NOTE Confidence: 0.9264122825

00:52:28.850 --> 00:52:30.524 There's no question about it and

NOTE Confidence: 0.9264122825

00:52:30.524 --> 00:52:31.930 their parents struggle as well,

NOTE Confidence: 0.9264122825

00:52:31.930 --> 00:52:34.348 but they do universally, really well.

NOTE Confidence: 0.950234177142857

00:52:35.720 --> 00:52:38.574 Well, I think that these kids also may

NOTE Confidence: 0.950234177142857

00:52:38.574 --> 00:52:40.212 have an even brighter future based on

NOTE Confidence: 0.950234177142857

00:52:40.212 --> 00:52:42.020 some of the work you've been doing.

NOTE Confidence: 0.950234177142857

00:52:42.020 --> 00:52:44.589 Jeff, I mean the the ability to

NOTE Confidence: 0.950234177142857

00:52:44.589 --> 00:52:46.471 identify these kids early and

NOTE Confidence: 0.950234177142857

00:52:46.471 --> 00:52:48.577 really change a lot of lives.

NOTE Confidence: 0.950234177142857

00:52:48.580 --> 00:52:50.560 I have a from auto Phoenix.

NOTE Confidence: 0.950234177142857

00:52:50.560 --> 00:52:52.590 Ask says this is fascinating and so

NOTE Confidence: 0.950234177142857

00:52:52.590 --> 00:52:54.401 so important that I'm thrilled that

NOTE Confidence: 0.950234177142857

00:52:54.401 --> 00:52:56.466 you were driving to policy with this

NOTE Confidence: 0.950234177142857

00:52:56.526 --> 00:52:58.622 for school aged children earlier than

NOTE Confidence: 0.950234177142857

00:52:58.622 --> 00:53:00.577 reading failure is language delay.

NOTE Confidence: 0.950234177142857

00:53:00.580 --> 00:53:03.110 Does any of the data point to a way to

NOTE Confidence: 0.950234177142857

00:53:03.180 --> 00:53:05.610 screen genetically for this in order

NOTE Confidence: 0.950234177142857

00:53:05.610 --> 00:53:07.980 to intervene even before school age?

NOTE Confidence: 0.950234177142857

00:53:07.980 --> 00:53:09.432 If we could do newborn screening

NOTE Confidence: 0.950234177142857

00:53:09.432 --> 00:53:10.158 for language delay,

NOTE Confidence: 0.950234177142857

00:53:10.160 --> 00:53:11.580 we could start early

NOTE Confidence: 0.950234177142857

00:53:11.580 --> 00:53:12.290 intervention immediately.

NOTE Confidence: 0.884992815

00:53:13.250 --> 00:53:15.510 So I should pay you out 'cause that was like,

NOTE Confidence: 0.884992815

00:53:15.510 --> 00:53:17.754 that's like the question about language

NOTE Confidence: 0.884992815

00:53:17.754 --> 00:53:20.011 delay or specific language impairment and

NOTE Confidence: 0.884992815

00:53:20.011 --> 00:53:22.475 reading disability comes up all the time.

NOTE Confidence: 0.884992815

00:53:22.480 --> 00:53:26.088 Roughly, if you if you if you if

NOTE Confidence: 0.884992815

00:53:26.088 --> 00:53:28.104 you do a really careful history on

NOTE Confidence: 0.884992815

00:53:28.104 --> 00:53:29.820 children with reading disability,

NOTE Confidence: 0.884992815

00:53:29.820 --> 00:53:33.588 about a third of those kids had had

NOTE Confidence: 0.884992815

00:53:33.588 --> 00:53:35.780 very significant language delay,

NOTE Confidence: 0.884992815

00:53:35.780 --> 00:53:37.836 that is delay in onset of language again

NOTE Confidence: 0.884992815

00:53:37.836 --> 00:53:40.146 just to remind everybody I'm talking

NOTE Confidence: 0.884992815

00:53:40.146 --> 00:53:41.886 about typically developing children.

NOTE Confidence: 0.884992815

00:53:41.890 --> 00:53:44.263 Children with normal IQ's, but if they're

NOTE Confidence: 0.884992815

00:53:44.263 --> 00:53:46.059 struggling and they clearly have,

NOTE Confidence: 0.884992815

00:53:46.060 --> 00:53:46.940 you know, and they're tested,

NOTE Confidence: 0.884992815

00:53:46.940 --> 00:53:48.116 and they really have a reading

NOTE Confidence: 0.884992815

00:53:48.116 --> 00:53:49.639 disability if you do a careful history,

NOTE Confidence: 0.884992815

00:53:49.640 --> 00:53:51.626 you'll find that roughly a third

NOTE Confidence: 0.884992815

00:53:51.626 --> 00:53:52.619 of those kids.

NOTE Confidence: 0.884992815

00:53:52.620 --> 00:53:54.270 Well, it had language impairment,

NOTE Confidence: 0.884992815

00:53:54.270 --> 00:53:55.954 delayed onset and speech.

NOTE Confidence: 0.884992815

00:53:55.954 --> 00:53:57.414 18 months, 22 months,

NOTE Confidence: 0.884992815

00:53:57.414 --> 00:53:59.256 24 months even older than that,

NOTE Confidence: 0.884992815

00:53:59.260 --> 00:54:01.241 there is a significant overlap and when

NOTE Confidence: 0.884992815

00:54:01.241 --> 00:54:03.676 we look at the genetic association of

NOTE Confidence: 0.884992815

00:54:03.676 --> 00:54:05.576 jeans that were primarily identified

NOTE Confidence: 0.884992815

00:54:05.576 --> 00:54:07.845 for reading and then you go around and

NOTE Confidence: 0.884992815

00:54:07.845 --> 00:54:09.682 you and you use those as candidate

NOTE Confidence: 0.884992815

00:54:09.682 --> 00:54:10.997 genes for looking at language,

NOTE Confidence: 0.884992815

00:54:11.000 --> 00:54:12.680 they overlap a great deal.

NOTE Confidence: 0.884992815

00:54:12.680 --> 00:54:14.564 There are some unique genes specifically

NOTE Confidence: 0.884992815

00:54:14.564 --> 00:54:16.212 for language impairment and there

NOTE Confidence: 0.884992815

00:54:16.212 --> 00:54:17.576 are unique genes specifically

NOTE Confidence: 0.884992815

00:54:17.576 --> 00:54:18.599 for reading disability,

NOTE Confidence: 0.884992815

00:54:18.600 --> 00:54:20.340 but the overlap is significant

NOTE Confidence: 0.884992815

00:54:20.340 --> 00:54:22.651 and that can explain why there's

NOTE Confidence: 0.884992815

00:54:22.651 --> 00:54:24.169 the shared heritability.

NOTE Confidence: 0.884992815

00:54:24.170 --> 00:54:26.151 If you go forward and you look

NOTE Confidence: 0.884992815

00:54:26.151 --> 00:54:28.164 at kids who are diagnosed with

NOTE Confidence: 0.884992815

00:54:28.164 --> 00:54:29.247 specific language impairment,

NOTE Confidence: 0.884992815

00:54:29.250 --> 00:54:29.646 again,

NOTE Confidence: 0.884992815

00:54:29.646 --> 00:54:32.162 about 20 to 30% of those kids will

NOTE Confidence: 0.884992815

00:54:32.162 --> 00:54:34.137 get into trouble by the end of first

NOTE Confidence: 0.884992815

00:54:34.137 --> 00:54:35.950 grade beginning of 2nd grade and will

NOTE Confidence: 0.884992815

00:54:35.950 --> 00:54:37.732 have reading disability so those kids

NOTE Confidence: 0.884992815

00:54:37.732 --> 00:54:40.046 have to be very carefully watched as

NOTE Confidence: 0.884992815

00:54:40.046 --> 00:54:42.554 far as newborn screening is concerned.

NOTE Confidence: 0.884992815

00:54:42.560 --> 00:54:45.552 When we ask the question a few years ago,

NOTE Confidence: 0.884992815

00:54:45.552 --> 00:54:47.340 how many tests in a newborn

NOTE Confidence: 0.884992815

00:54:47.416 --> 00:54:49.246 screening were done by DNA?

NOTE Confidence: 0.884992815

00:54:49.250 --> 00:54:51.202 The answer was zero.

NOTE Confidence: 0.884992815

00:54:51.202 --> 00:54:52.666 That's slowly changing,

NOTE Confidence: 0.884992815

00:54:52.670 --> 00:54:54.502 and so DNA screening.

NOTE Confidence: 0.884992815

00:54:54.502 --> 00:54:57.100 Not only is it potentially

NOTE Confidence: 0.884992815

00:54:57.100 --> 00:55:00.140 incredibly sensitive and specific,

NOTE Confidence: 0.884992815

00:55:00.140 --> 00:55:01.072 it's scaleable.

NOTE Confidence: 0.884992815

00:55:01.072 --> 00:55:04.334 That means the cost can be incredibly

NOTE Confidence: 0.884992815

00:55:04.334 --> 00:55:07.418 low and so that's what the hope is,

NOTE Confidence: 0.884992815

00:55:07.420 --> 00:55:10.516 and so we're pursuing various ways

NOTE Confidence: 0.884992815

00:55:10.520 --> 00:55:13.474 to get states to think about this,

NOTE Confidence: 0.884992815

00:55:13.480 --> 00:55:14.964 or at least to fund this at

NOTE Confidence: 0.884992815

00:55:14.964 --> 00:55:16.449 least as a pilot project.

NOTE Confidence: 0.884992815

00:55:16.450 --> 00:55:17.880 But that's exactly right auto.

NOTE Confidence: 0.884992815

00:55:17.880 --> 00:55:18.910 That's what we're trying to do.

NOTE Confidence: 0.76731277

00:55:20.920 --> 00:55:22.544 I think we have time for one more question.

NOTE Confidence: 0.784843681428571

00:55:22.550 --> 00:55:24.170 Jeff from Joe Abney.

NOTE Confidence: 0.784843681428571

00:55:24.170 --> 00:55:25.385 Singer exciting work.

NOTE Confidence: 0.784843681428571

00:55:25.390 --> 00:55:26.830 Have you moved the genetic testing

NOTE Confidence: 0.784843681428571

00:55:26.830 --> 00:55:28.962 to the point of the test that has

NOTE Confidence: 0.784843681428571

00:55:28.962 --> 00:55:30.357 a receiver operating curve that

NOTE Confidence: 0.784843681428571

00:55:30.357 --> 00:55:31.650 provides data on sensitivity,

NOTE Confidence: 0.784843681428571

00:55:31.650 --> 00:55:33.375 specificity, positive predictive

NOTE Confidence: 0.784843681428571

00:55:33.375 --> 00:55:36.250 value and negative predictive value.

NOTE Confidence: 0.784843681428571

00:55:36.250 --> 00:55:38.538 That's well, let me finish the question here.

NOTE Confidence: 0.784843681428571

00:55:38.540 --> 00:55:40.472 Hold on to that since kids with

NOTE Confidence: 0.784843681428571

00:55:40.472 --> 00:55:42.569 dyslexia are a heterogeneous group,

NOTE Confidence: 0.784843681428571

00:55:42.570 --> 00:55:44.698 does your work focus on the most common

NOTE Confidence: 0.784843681428571

00:55:44.698 --> 00:55:46.470 phenotype of phonological awareness,

NOTE Confidence: 0.784843681428571

00:55:46.470 --> 00:55:48.899 or do you have data on the

NOTE Confidence: 0.784843681428571

00:55:48.899 --> 00:55:49.593 orthographic variants?

NOTE Confidence: 0.872389497272727

00:55:50.900 --> 00:55:52.377 OK, so let me attack the first

NOTE Confidence: 0.872389497272727

00:55:52.377 --> 00:55:53.820 part of the question. First.

NOTE Confidence: 0.872389497272727

00:55:53.820 --> 00:55:55.320 Joe, it's a great question.

NOTE Confidence: 0.872389497272727

00:55:55.320 --> 00:55:56.588 Short answer is no,

NOTE Confidence: 0.872389497272727

00:55:56.588 --> 00:55:58.490 and and the reason is because

NOTE Confidence: 0.872389497272727

00:55:58.556 --> 00:56:01.048 in or certainly we could do it

NOTE Confidence: 0.872389497272727

00:56:01.048 --> 00:56:02.917 retrospectively and when we do

NOTE Confidence: 0.872389497272727

00:56:02.917 --> 00:56:04.757 we get a reasonable sensitivity

NOTE Confidence: 0.872389497272727

00:56:04.757 --> 00:56:06.188 and incredibly good specificity.

NOTE Confidence: 0.872389497272727

00:56:06.188 --> 00:56:08.414 But as far as a receiver operating

NOTE Confidence: 0.872389497272727

00:56:08.414 --> 00:56:10.399 curve you really want to do that.

NOTE Confidence: 0.872389497272727

00:56:10.400 --> 00:56:12.500 We could do that, you know,

NOTE Confidence: 0.872389497272727

00:56:12.500 --> 00:56:13.150 looking backwards,

NOTE Confidence: 0.872389497272727

00:56:13.150 --> 00:56:15.750 but the real way to do this would

NOTE Confidence: 0.872389497272727

00:56:15.813 --> 00:56:18.185 be a uh as a looking forward that

NOTE Confidence: 0.872389497272727

00:56:18.185 --> 00:56:20.580 is your identified or you just.

NOTE Confidence: 0.872389497272727

00:56:20.580 --> 00:56:22.260 You take a cohort of children,

NOTE Confidence: 0.872389497272727

00:56:22.260 --> 00:56:23.784 follow them for three to five

NOTE Confidence: 0.872389497272727

00:56:23.784 --> 00:56:25.459 years and and and do testing,

NOTE Confidence: 0.872389497272727

00:56:25.460 --> 00:56:27.197 and that's what the next stage is so we

NOTE Confidence: 0.872389497272727

00:56:27.197 --> 00:56:28.917 can do that receiver operating curve.

NOTE Confidence: 0.872389497272727

00:56:28.920 --> 00:56:30.100 So we're not there yet,

NOTE Confidence: 0.872389497272727

00:56:30.100 --> 00:56:31.520 but I think we're getting

NOTE Confidence: 0.872389497272727

00:56:31.520 --> 00:56:32.656 closer to being there.

NOTE Confidence: 0.872389497272727

00:56:32.660 --> 00:56:34.556 As far as subtests are concerned,

NOTE Confidence: 0.872389497272727

00:56:34.560 --> 00:56:36.695 this is the Holy Grail of neuropsychologists.

NOTE Confidence: 0.872389497272727

00:56:36.700 --> 00:56:38.644 I get asked this question all the time.

NOTE Confidence: 0.872389497272727

00:56:38.650 --> 00:56:39.878 Can you tell me?

NOTE Confidence: 0.872389497272727

00:56:39.878 --> 00:56:41.106 Does the reading disability

NOTE Confidence: 0.872389497272727

00:56:41.106 --> 00:56:42.957 that we're seeing in this child?

NOTE Confidence: 0.872389497272727

00:56:42.960 --> 00:56:44.984 Is it more to do with orthographic coding?

NOTE Confidence: 0.872389497272727

00:56:44.990 --> 00:56:47.240 Is more to do with phonological

NOTE Confidence: 0.872389497272727

00:56:47.240 --> 00:56:49.018 awareness and and and so then the

NOTE Confidence: 0.872389497272727

00:56:49.018 --> 00:56:50.516 intervention might be a little different

NOTE Confidence: 0.872389497272727

00:56:50.516 --> 00:56:52.322 and I can tailor to the child.

NOTE Confidence: 0.872389497272727

00:56:52.330 --> 00:56:53.610 We'd love to do that.

NOTE Confidence: 0.872389497272727

00:56:53.610 --> 00:56:55.794 The thing to remember is that

NOTE Confidence: 0.872389497272727

00:56:55.794 --> 00:56:57.790 there is no orthographic coding,

NOTE Confidence: 0.872389497272727

00:56:57.790 --> 00:56:59.846 and for the the the for the non

NOTE Confidence: 0.872389497272727

00:56:59.846 --> 00:57:01.835 informed of the group when we're

NOTE Confidence: 0.872389497272727

00:57:01.835 --> 00:57:03.600 talking about is really spelling

NOTE Confidence: 0.872389497272727

00:57:03.600 --> 00:57:05.209 there is no spelling gene.

NOTE Confidence: 0.872389497272727

00:57:05.210 --> 00:57:06.870 There's no grammar gene,

NOTE Confidence: 0.872389497272727

00:57:06.870 --> 00:57:08.530 there's no decoding gene.

NOTE Confidence: 0.872389497272727

00:57:08.530 --> 00:57:10.174 Remember genes encode proteins,

NOTE Confidence: 0.872389497272727

00:57:10.174 --> 00:57:12.640 proteins make up the receptors and

NOTE Confidence: 0.872389497272727

00:57:12.708 --> 00:57:14.888 the neurotransmitters or the brain.

NOTE Confidence: 0.872389497272727

00:57:14.890 --> 00:57:17.391 They make up the glea, the neurons, etc.

NOTE Confidence: 0.872389497272727

00:57:17.391 --> 00:57:19.426 The workhorses of the cell,

NOTE Confidence: 0.872389497272727

00:57:19.430 --> 00:57:21.080 and so they worked together

NOTE Confidence: 0.872389497272727

00:57:21.080 --> 00:57:22.400 in combination with different

NOTE Confidence: 0.872389497272727

00:57:22.400 --> 00:57:23.898 systems in order to enable us.

NOTE Confidence: 0.872389497272727

00:57:23.900 --> 00:57:26.994 To do these very complex very human

NOTE Confidence: 0.872389497272727

00:57:26.994 --> 00:57:29.198 things called decoding or reading

NOTE Confidence: 0.872389497272727

00:57:29.198 --> 00:57:31.598 and spelling and music as well.

NOTE Confidence: 0.872389497272727

00:57:31.600 --> 00:57:33.220 And so it it's not.

NOTE Confidence: 0.872389497272727

00:57:33.220 --> 00:57:34.700 It's it probably isn't going

NOTE Confidence: 0.872389497272727

00:57:34.700 --> 00:57:36.180 to be a single gene,

NOTE Confidence: 0.872389497272727

00:57:36.180 --> 00:57:38.684 but it may be a panel of genes

NOTE Confidence: 0.872389497272727

00:57:38.684 --> 00:57:41.560 or a panel a panoply perhaps,

NOTE Confidence: 0.872389497272727

00:57:41.560 --> 00:57:43.540 or a profile of certain variants

NOTE Confidence: 0.872389497272727

00:57:43.540 --> 00:57:46.079 that may be more weighted towards,

NOTE Confidence: 0.872389497272727

00:57:46.080 --> 00:57:47.724 say, decoding versus spelling,

NOTE Confidence: 0.872389497272727

00:57:47.724 --> 00:57:49.779 but we don't know yet.

NOTE Confidence: 0.872389497272727

00:57:49.780 --> 00:57:51.250 The studies aren't large enough yet.

NOTE Confidence: 0.735784878

00:57:52.710 --> 00:57:54.110 Well Jeff, you know you.

NOTE Confidence: 0.735784878

00:57:54.110 --> 00:57:56.330 You left plenty of time for

NOTE Confidence: 0.735784878

00:57:56.330 --> 00:57:58.162 Q&A and our time is up,

NOTE Confidence: 0.735784878

00:57:58.162 --> 00:58:00.310 but I apologize to the many people.

NOTE Confidence: 0.735784878

00:58:00.310 --> 00:58:01.648 There's a lot of enthusiasm for

NOTE Confidence: 0.735784878

00:58:01.648 --> 00:58:03.106 this talk and many questions and

NOTE Confidence: 0.735784878

00:58:03.106 --> 00:58:04.648 comments which we didn't get to.

NOTE Confidence: 0.735784878

00:58:04.650 --> 00:58:06.380 So let me just congratulate

NOTE Confidence: 0.735784878

00:58:06.380 --> 00:58:08.690 you on a marvelous talk and I

NOTE Confidence: 0.735784878

00:58:08.690 --> 00:58:10.430 think that takes up our hour

NOTE Confidence: 0.735784878

00:58:10.430 --> 00:58:12.280 and thanks everybody for coming.