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
- $00{:}00{:}04{.}610 \dashrightarrow 00{:}00{:}05{.}810$ We have a few announcements,
- NOTE Confidence: 0.921104202
- $00:00:05.810 \dashrightarrow 00:00:08.590$ upcoming grand rounds next week,
- NOTE Confidence: 0.921104202
- $00{:}00{:}08.590 \dashrightarrow 00{:}00{:}11.356$ March 30th is one of our.
- NOTE Confidence: 0.921104202
- $00:00:11.360 \dashrightarrow 00:00:13.865$ A special lectures named lecture
- NOTE Confidence: 0.921104202
- 00:00:13.865 --> 00:00:17.040 and part of our Centennial series,
- NOTE Confidence: 0.921104202
- $00:00:17.040 \longrightarrow 00:00:18.666$ the C DAF Cook Lectureship.
- NOTE Confidence: 0.921104202
- $00:00:18.666 \dashrightarrow 00:00:21.078$ Those of you who don't remember
- NOTE Confidence: 0.921104202
- $00{:}00{:}21.078 \dashrightarrow 00{:}00{:}23.685$ that Cook was a former chair of
- NOTE Confidence: 0.921104202
- $00{:}00{:}23.685 \dashrightarrow 00{:}00{:}26.680$ the Department of Pediatrics.
- NOTE Confidence: 0.921104202
- 00:00:26.680 --> 00:00:27.712 And Kinari Webb,
- NOTE Confidence: 0.921104202
- $00:00:27.712 \longrightarrow 00:00:29.432$ who's in family medicine and
- NOTE Confidence: 0.921104202
- $00:00:29.432 \longrightarrow 00:00:31.360$ founder of health and harmony,
- NOTE Confidence: 0.921104202

 $00:00:31.360 \longrightarrow 00:00:33.480$ will be speaking on healing

NOTE Confidence: 0.921104202

 $00:00:33.480 \longrightarrow 00:00:35.600$ the planet by recognizing the

NOTE Confidence: 0.921104202

 $00{:}00{:}35.679 \dashrightarrow 00{:}00{:}38.359$ fundamental sickness of colonialism.

NOTE Confidence: 0.921104202

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

NOTE Confidence: 0.921104202

 $00:00:39.760 \longrightarrow 00:00:41.770$ Then on April 6th we're going

NOTE Confidence: 0.921104202

 $00:00:41.770 \longrightarrow 00:00:43.260$ to be having care rounds,

NOTE Confidence: 0.921104202

 $00{:}00{:}43.260 \dashrightarrow 00{:}00{:}45.986$ which are conversations and

NOTE Confidence: 0.921104202

 $00{:}00{:}45.986 \dashrightarrow 00{:}00{:}48.434$ 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

 $00:00:51.164 \rightarrow 00:00:53.399$ 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

 $00:00:59.180 \longrightarrow 00:01:01.690$ this Monday or monthly pediatric

NOTE Confidence: 0.7674788

 $00:01:01.772 \rightarrow 00:01:03.257$ educational learning community

NOTE Confidence: 0.7674788

 $00:01:03.257 \rightarrow 00:01:06.227$ series will be led by Galloping

NOTE Confidence: 0.7674788

 $00{:}01{:}06{.}227 \dashrightarrow 00{:}01{:}08{.}550$ Me Soma and Gunjan Tiagra,

NOTE Confidence: 0.7674788

 $00:01:08.550 \rightarrow 00:01:10.794$ both from the section of emergency

- NOTE Confidence: 0.7674788
- $00:01:10.794 \longrightarrow 00:01:12.290$ medicine on introduction to

 $00{:}01{:}12.351 \dashrightarrow 00{:}01{:}14.100$ qualitative research methods,

NOTE Confidence: 0.7674788

 $00:01:14.100 \rightarrow 00:01:15.808$ exploring factors that influence

NOTE Confidence: 0.7674788

 $00:01:15.808 \rightarrow 00:01:17.943$ the choice of academic pediatricians

NOTE Confidence: 0.7674788

 $00:01:17.943 \rightarrow 00:01:20.099$ by underrepresented minorities.

NOTE Confidence: 0.82551742

 $00{:}01{:}25{.}340 \dashrightarrow 00{:}01{:}26{.}816$ 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

 $00:01:32.610 \rightarrow 00:01:34.950$ Symposium and this year's topic

NOTE Confidence: 0.82551742

 $00:01:35.022 \rightarrow 00:01:37.227$ is ethical issues in neonatology?

NOTE Confidence: 0.82551742

 $00:01:37.230 \longrightarrow 00:01:40.036$ This will be taking place virtually Tuesday,

NOTE Confidence: 0.82551742

 $00:01:40.036 \longrightarrow 00:01:44.128$ April 5th from 1:00 to 5:30.

NOTE Confidence: 0.82551742

 $00{:}01{:}44{.}130 \dashrightarrow 00{:}01{:}46{.}905$ There will be a incredible

NOTE Confidence: 0.82551742

 $00{:}01{:}46{.}905 \dashrightarrow 00{:}01{:}49{.}522$ lineup of speakers and talking

- $00:01:49.522 \rightarrow 00:01:51.902$ about these important topics in
- NOTE Confidence: 0.82551742
- $00:01:51.902 \longrightarrow 00:01:54.350$ ethics related to neonatology,
- NOTE Confidence: 0.82551742
- $00:01:54.350 \longrightarrow 00:01:55.418$ so please join us.
- NOTE Confidence: 0.760267842
- $00:01:59.340 \longrightarrow 00:02:01.888$ There are no conflicts and no contact,
- NOTE Confidence: 0.760267842
- $00:02:01.890 \dashrightarrow 00:02:04.025$ no disclosures that need to be made.
- NOTE Confidence: 0.766402963333333
- $00{:}02{:}06{.}310 \dashrightarrow 00{:}02{:}08{.}668$ This is accredited for see me
- NOTE Confidence: 0.766402963333333
- $00:02:08.670 \longrightarrow 00:02:10.728$ by the Yale School of Medicine.
- NOTE Confidence: 0.766402963333333
- $00:02:10.730 \longrightarrow 00:02:12.122$ There's the number.
- NOTE Confidence: 0.766402963333333
- $00{:}02{:}12.122 \dashrightarrow 00{:}02{:}14.906$ The text to the CME office
- NOTE Confidence: 0.766402963333333
- $00:02:14.910 \longrightarrow 00:02:17.794$ 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
- $00:02:19.670 \longrightarrow 00:02:21.070$ throughout the grand rounds.
- NOTE Confidence: 0.953836716
- $00:02:25.470 \longrightarrow 00:02:27.618$ 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
- $00:02:30.280 \longrightarrow 00:02:32.740$ 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
- $00:02:44.250 \longrightarrow 00:02:46.258$ screen for a moment if I could.
- NOTE Confidence: 0.8568894
- $00{:}02{:}49{.}240 \dashrightarrow 00{:}02{:}51{.}762$ Let's go with this and share and
- NOTE Confidence: 0.8568894
- $00:02:51.762 \rightarrow 00:02:54.156$ are you looking at my slides now?
- NOTE Confidence: 0.8568894
- $00{:}02{:}54{.}160 \dashrightarrow 00{:}02{:}57{.}171$ 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
- $00{:}02{:}59{.}444 \dashrightarrow 00{:}03{:}01{.}140$ 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
- $00{:}03{:}07{.}520 \dashrightarrow 00{:}03{:}10{.}019$ and Yale Science, but of course he
- NOTE Confidence: 0.8568894
- $00:03:10.019 \dashrightarrow 00:03:12.630$ didn't start out as such a big cheese.
- NOTE Confidence: 0.8568894
- $00:03:12.630 \dashrightarrow 00:03:15.843$ He was got his BS and MD at Tulane,
- NOTE Confidence: 0.8568894
- $00:03:15.850 \rightarrow 00:03:18.234$ came to Yale where he did his residency NOTE Confidence: 0.8568894

 $00{:}03{:}18.234 \dashrightarrow 00{:}03{:}20.455$ and fellowship and Jeff and I traveled

NOTE Confidence: 0.8568894

 $00:03:20.455 \rightarrow 00:03:22.025$ this journey together ever since.

NOTE Confidence: 0.8568894

 $00{:}03{:}22{.}030 \dashrightarrow 00{:}03{:}23{.}962$ And so it's been my absolute pleasure

NOTE Confidence: 0.8568894

 $00{:}03{:}23{.}962 \dashrightarrow 00{:}03{:}25{.}964$ to watch him rise through the ranks.

NOTE Confidence: 0.8568894

 $00{:}03{:}25{.}970 \dashrightarrow 00{:}03{:}28{.}662$ So let's see if we can get this slide

NOTE Confidence: 0.8568894

 $00:03:28.662 \rightarrow 00:03:31.068$ to advance and apparently we can't.

NOTE Confidence: 0.8568894

 $00:03:31.070 \longrightarrow 00:03:31.769$ Let's try that.

NOTE Confidence: 0.8568894

 $00:03:31.769 \longrightarrow 00:03:33.682$ So here we go back a little bit

NOTE Confidence: 0.8568894

 $00{:}03{:}33{.}682 \dashrightarrow 00{:}03{:}35{.}243$ in time and we see this here.

NOTE Confidence: 0.8568894

 $00:03:35.250 \rightarrow 00:03:36.402$ I don't know if you can see my cursor.

NOTE Confidence: 0.8568894

 $00{:}03{:}36{.}410 \dashrightarrow 00{:}03{:}37{.}460$ We see the second from the left.

NOTE Confidence: 0.8568894

 $00:03:37.460 \rightarrow 00:03:39.870$ Standing up is a young Jeff grew in with his

NOTE Confidence: 0.8568894

 $00{:}03{:}39{.}927 \dashrightarrow 00{:}03{:}42{.}223$ dog with his wife Susan here and Michelle.

NOTE Confidence: 0.8568894

 $00:03:42.230 \rightarrow 00:03:42.788$ I see everybody.

NOTE Confidence: 0.8568894

 $00{:}03{:}42.788 \dashrightarrow 00{:}03{:}44.090$ We had a lot of babies were

NOTE Confidence: 0.8568894

 $00:03:44.139 \rightarrow 00:03:45.369$ 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
- $00{:}03{:}47{.}232 \dashrightarrow 00{:}03{:}49{.}498$ of 85 in my backyard in Hamden.
- NOTE Confidence: 0.8568894
- $00:03:49.500 \dashrightarrow 00:03:51.204$ This is a young Luciano Pavarotti
- NOTE Confidence: 0.8568894
- $00:03:51.204 \rightarrow 00:03:53.070$ you see over here at the time.
- NOTE Confidence: 0.8568894
- $00:03:53.070 \rightarrow 00:03:56.007$ And this is and and again, Michelle.
- NOTE Confidence: 0.8568894
- $00:03:56.007 \dashrightarrow 00:03:58.226$ Jeff's daughter was not in this picture,
- NOTE Confidence: 0.8568894
- $00:03:58.230 \longrightarrow 00:04:00.456$ but I've had the pleasure
- NOTE Confidence: 0.8568894
- $00:04:00.456 \longrightarrow 00:04:01.940$ of watching Doctor Gruen.
- NOTE Confidence: 0.8568894
- $00{:}04{:}01{.}940 \dashrightarrow 00{:}04{:}03{.}984$ Just rise through the ranks over the
- NOTE Confidence: 0.8568894
- $00{:}04{:}03{.}984 \dashrightarrow 00{:}04{:}06{.}849$ years and grow gradually to be the the
- NOTE Confidence: 0.8568894
- $00{:}04{:}06{.}849 \dashrightarrow 00{:}04{:}09{.}867$ 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
- $00:04:11.970 \longrightarrow 00:04:13.110$ 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
- $00{:}04{:}16.126 \dashrightarrow 00{:}04{:}18.282$ honorary professor at Shenzhen
- NOTE Confidence: 0.8568894

 $00:04:18.282 \rightarrow 00:04:20.209$ 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

 $00:04:22.310 \longrightarrow 00:04:24.410$ 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

 $00{:}04{:}28{.}710 \dashrightarrow 00{:}04{:}30{.}018$ 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

 $00{:}04{:}32.890 \dashrightarrow 00{:}04{:}35.620$ he's really a valued mentor and advisor

NOTE Confidence: 0.8568894

 $00:04:35.620 \rightarrow 00:04:38.249$ to medical students to graduate students,

NOTE Confidence: 0.8568894

 $00{:}04{:}38{.}250 \dashrightarrow 00{:}04{:}40{.}210$ 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

 $00{:}04{:}41.710 \dashrightarrow 00{:}04{:}44.725$ to at least one very grateful Chief for

NOTE Confidence: 0.8568894

 $00:04:44.725 \rightarrow 00:04:47.501$ whom he's been a valued advisor for many,

NOTE Confidence: 0.8568894

 $00:04:47.510 \longrightarrow 00:04:48.118$ 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,

 $00{:}04{:}53{.}370 \dashrightarrow 00{:}04{:}54{.}798$ highly respected scholar and

NOTE Confidence: 0.8568894

 $00{:}04{:}54{.}798 \dashrightarrow 00{:}04{:}56{.}226$ investigator that he is.

NOTE Confidence: 0.8568894

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

NOTE Confidence: 0.8568894

 $00{:}04{:}56.818 \dashrightarrow 00{:}04{:}58.288$ 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

 $00:04:59.790 \longrightarrow 00:05:01.316$ and you're going to hear a bit

NOTE Confidence: 0.8568894

 $00:05:01.316 \longrightarrow 00:05:01.970$ about that today.

NOTE Confidence: 0.8568894

 $00{:}05{:}01{.}970 \dashrightarrow 00{:}05{:}02{.}675$ And as such,

NOTE Confidence: 0.8568894

 $00:05:02.675 \longrightarrow 00:05:04.320$ the talk should really be of interest

NOTE Confidence: 0.8568894

 $00{:}05{:}04{.}371 \dashrightarrow 00{:}05{:}05{.}826$ to any body who's interested in

NOTE Confidence: 0.8568894

 $00{:}05{:}05{.}826 \dashrightarrow 00{:}05{:}07{.}281$ genetics or studies genetics or

NOTE Confidence: 0.8568894

 $00{:}05{:}07{.}337 \dashrightarrow 00{:}05{:}08{.}884$ who wants to learn more about it,

NOTE Confidence: 0.8568894

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

NOTE Confidence: 0.8568894

 $00:05:11.014 \rightarrow 00:05:12.768$ kids with learning disabilities or

 $00:05:12.768 \dashrightarrow 00:05:14.406$ wants to learn more about that.

NOTE Confidence: 0.8568894

 $00{:}05{:}14{.}410 \dashrightarrow 00{:}05{:}15{.}916$ But there's the lecture will also

NOTE Confidence: 0.8568894

 $00:05:15.916 \dashrightarrow 00:05:17.735$ be of interest to any body who wants

NOTE Confidence: 0.8568894

 $00:05:17.735 \longrightarrow 00:05:19.000$ 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

 $00:05:20.800 \rightarrow 00:05:21.500$ and many of you know,

NOTE Confidence: 0.8568894

 $00:05:21.500 \rightarrow 00:05:23.838$ and you're all about to find out,

NOTE Confidence: 0.8568894

 $00{:}05{:}23.840 \dashrightarrow 00{:}05{:}25.640$ our friend Jeff can teach.

NOTE Confidence: 0.8568894

 $00{:}05{:}25{.}640 \dashrightarrow 00{:}05{:}27{.}270$ He can take difficult subjects

NOTE Confidence: 0.8568894

 $00{:}05{:}27{.}270 \dashrightarrow 00{:}05{:}28{.}900$ and make them accessible to

NOTE Confidence: 0.863640104736842

 $00{:}05{:}28{.}957 \dashrightarrow 00{:}05{:}31{.}549$ to the point where even a bioethicist can

NOTE Confidence: 0.863640104736842

 $00{:}05{:}31{.}549 \dashrightarrow 00{:}05{:}33{.}950$ understand he's an extremely gifted teacher,

NOTE Confidence: 0.863640104736842

 $00:05:33.950 \longrightarrow 00:05:35.120$ and he's also, by the way,

NOTE Confidence: 0.863640104736842

 $00:05:35.120 \longrightarrow 00:05:36.644$ a very gifted neonatologist.

NOTE Confidence: 0.863640104736842

 $00:05:36.644 \rightarrow 00:05:38.930$ He is the triple threat that

NOTE Confidence: 0.863640104736842

 $00:05:38.998 \rightarrow 00:05:41.068$ people talk about on academics,

- NOTE Confidence: 0.863640104736842
- $00:05:41.070 \longrightarrow 00:05:42.380$ and it's really been my
- NOTE Confidence: 0.863640104736842
- $00:05:42.380 \longrightarrow 00:05:43.428$ pleasure and honor to.
- NOTE Confidence: 0.863640104736842
- $00:05:43.430 \longrightarrow 00:05:45.086$ Have this journey with Jeff for
- NOTE Confidence: 0.863640104736842
- $00{:}05{:}45.086 \dashrightarrow 00{:}05{:}46.190$ the last many years.
- NOTE Confidence: 0.863640104736842
- $00{:}05{:}46.190 \dashrightarrow 00{:}05{:}47.177$ As you can see from that picture,
- NOTE Confidence: 0.863640104736842
- $00:05:47.180 \dashrightarrow 00:05:49.084$ you know I think Cliff is still celebrating.
- NOTE Confidence: 0.863640104736842
- $00:05:49.090 \dashrightarrow 00:05:51.250$ We're all still celebrating 100 years
- NOTE Confidence: 0.863640104736842
- $00:05:51.250 \rightarrow 00:05:53.806$ of Yale Pediatrics and so they
- NOTE Confidence: 0.863640104736842
- $00{:}05{:}53.806 \dashrightarrow 00{:}05{:}55.780$ wanted a couple of guys today who
- NOTE Confidence: 0.863640104736842
- $00:05:55.780 \longrightarrow 00:05:58.090$ actually were here 100 years ago at
- NOTE Confidence: 0.863640104736842
- $00:05:58.090 \dashrightarrow 00:06:01.170$ 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
- $00{:}06{:}02{.}430 \dashrightarrow 00{:}06{:}03{.}690$ to introduce my friend,
- NOTE Confidence: 0.863640104736842
- 00:06:03.690 --> 00:06:04.360 Jeff Gruen.
- NOTE Confidence: 0.811512863333333
- $00{:}06{:}14.170 \dashrightarrow 00{:}06{:}17.994$ You know if you ever want an emotional
- NOTE Confidence: 0.811512863333333

 $00:06:17.994 \rightarrow 00:06:20.032$ 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

 $00:06:21.980 \longrightarrow 00:06:25.970$ not just a colleague for 35 years, it's.

NOTE Confidence: 0.811512863333333

 $00:06:25.970 \longrightarrow 00:06:27.475$ 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

 $00:06:33.690 \rightarrow 00:06:35.740$ Glad to help, Jeff, thank you.

NOTE Confidence: 0.940617793333333

 $00:06:38.180 \longrightarrow 00:06:40.385$ So I'm going to talk a little

NOTE Confidence: 0.940617793333333

 $00{:}06{:}40{.}385 \dashrightarrow 00{:}06{:}42{.}662$ bit about our new program for

NOTE Confidence: 0.940617793333333

 $00:06:42.662 \rightarrow 00:06:43.988$ learning disabilities research.

NOTE Confidence: 0.940617793333333

 $00:06:43.988 \longrightarrow 00:06:46.640$ 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

 $00:06:51.890 \longrightarrow 00:06:54.175$ Why is early identification of

NOTE Confidence: 0.940617793333333

 $00:06:54.175 \rightarrow 00:06:55.546$ learning disabilities important?

 $00:06:55.550 \rightarrow 00:06:57.447$ What is the scope of the problem?

NOTE Confidence: 0.940617793333333

 $00:06:57.450 \rightarrow 00:07:00.600$ How will early identification disrupt and

NOTE Confidence: 0.940617793333333

 $00:07:00.600 \rightarrow 00:07:03.430$ change the current educational paradigm?

NOTE Confidence: 0.940617793333333

 $00:07:03.430 \longrightarrow 00:07:05.374$ Where can we make a difference

NOTE Confidence: 0.940617793333333

 $00{:}07{:}05{.}374 \dashrightarrow 00{:}07{:}06{.}670$ and who are we?

NOTE Confidence: 0.940617793333333

 $00:07:06.670 \longrightarrow 00:07:10.238$ So let's get started and with all our

NOTE Confidence: 0.940617793333333

 $00:07:10.238 \dashrightarrow 00:07:12.310$ research we start in the classroom.

NOTE Confidence: 0.940617793333333

 $00:07:12.310 \longrightarrow 00:07:14.166$ 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

 $00:07:16.418 \rightarrow 00:07:18.206$ struggle with learning disabilities.

NOTE Confidence: 0.940617793333333

 $00:07:18.210 \longrightarrow 00:07:19.694$ These include things you've

NOTE Confidence: 0.940617793333333

 $00:07:19.694 \longrightarrow 00:07:21.920$ 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

 $00:07:23.704 \dashrightarrow 00:07:25.934$ also known as reading disability,

NOTE Confidence: 0.940617793333333

 $00{:}07{:}25.940 \dashrightarrow 00{:}07{:}27.293$ specific language impairment,

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

 $00:07:31.341 \rightarrow 00:07:33.576$ which is impairment of articulation,

NOTE Confidence: 0.940617793333333

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

NOTE Confidence: 0.940617793333333

 $00{:}07{:}34.174 \dashrightarrow 00{:}07{:}37.738$ a math disability and attention disorder,

NOTE Confidence: 0.940617793333333

 $00:07:37.740 \longrightarrow 00:07:39.078$ is better known to most folks.

NOTE Confidence: 0.940617793333333

 $00{:}07{:}39{.}080 \dashrightarrow 00{:}07{:}41{.}600$ Is ADHD and ADD dot.

NOTE Confidence: 0.940617793333333

 $00:07:41.600 \rightarrow 00:07:42.935$ But what I'm talking about

NOTE Confidence: 0.940617793333333

 $00{:}07{:}42.935 \dashrightarrow 00{:}07{:}44.908$ today and every and all the kids

NOTE Confidence: 0.940617793333333

 $00:07:44.908 \rightarrow 00:07:46.358$ that I'll be talking studies,

NOTE Confidence: 0.940617793333333

 $00:07:46.360 \dashrightarrow 00:07:49.433$ I'll be talking about today are students

NOTE Confidence: 0.940617793333333

 $00:07:49.433 \rightarrow 00:07:52.249$ in regular classes at regular schools.

NOTE Confidence: 0.940617793333333

 $00:07:52.250 \rightarrow 00:07:56.058$ 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

 $00:07:57.960 \rightarrow 00:08:00.660$ 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
- $00{:}08{:}02{.}305 \dashrightarrow 00{:}08{:}04{.}078$ data in a in a few minutes,
- NOTE Confidence: 0.940617793333333
- $00{:}08{:}04.080 \dashrightarrow 00{:}08{:}06.383$ but in the meantime there are three
- NOTE Confidence: 0.940617793333333
- $00:08:06.383 \rightarrow 00:08:08.600$ critical things to know about reading.
- NOTE Confidence: 0.940617793333333
- $00:08:08.600 \longrightarrow 00:08:11.258$ The first is that dyslexia or
- NOTE Confidence: 0.940617793333333
- $00:08:11.258 \rightarrow 00:08:13.650$ reading disability is really common,
- NOTE Confidence: 0.940617793333333
- $00{:}08{:}13.650 \dashrightarrow 00{:}08{:}16.149$ 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
- $00{:}08{:}18.120 \dashrightarrow 00{:}08{:}19.152$ 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
- $00:08:20.442 \rightarrow 00:08:21.879$ reading performance assessment.
- NOTE Confidence: 0.940617793333333
- $00:08:21.880 \rightarrow 00:08:24.405$ Let's say comprehension or single
- NOTE Confidence: 0.940617793333333
- $00:08:24.405 \longrightarrow 00:08:26.026$ word reading, and we.
- NOTE Confidence: 0.940617793333333
- $00:08:26.026 \longrightarrow 00:08:27.844$ We graph them the number of
- NOTE Confidence: 0.940617793333333
- $00:08:27.844 \longrightarrow 00:08:29.240$ readers at each point,
- NOTE Confidence: 0.940617793333333
- $00:08:29.240 \dashrightarrow 00:08:31.040$ 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

 $00{:}08{:}33{.}469 \dashrightarrow 00{:}08{:}35{.}474$ if you have enough students with

NOTE Confidence: 0.940617793333333

 $00:08:35.474 \rightarrow 00:08:37.515$ a mean and what we call reading

NOTE Confidence: 0.940617793333333

 $00:08:37.515 \dashrightarrow 00:08:39.220$ disability is basically a cut off.

NOTE Confidence: 0.940617793333333

 $00{:}08{:}39{.}220 \dashrightarrow 00{:}08{:}40{.}636$ It's a cut off at the tail end.

NOTE Confidence: 0.940617793333333

 $00{:}08{:}40.640 \dashrightarrow 00{:}08{:}41.900$ It's a lower end,

NOTE Confidence: 0.940617793333333

 $00:08:41.900 \rightarrow 00:08:44.959$ so most places do around the 10th percentile.

NOTE Confidence: 0.940617793333333

 $00{:}08{:}44{.}960 \dashrightarrow 00{:}08{:}47{.}816$ Some places do 15, some do 12 percentile.

NOTE Confidence: 0.940617793333333

 $00:08:47.820 \dashrightarrow 00:08:49.969$ But in the United States we're talking

NOTE Confidence: 0.940617793333333

 $00{:}08{:}49{.}969 \dashrightarrow 00{:}08{:}52{.}779$ about 5 to 10 million US school children.

NOTE Confidence: 0.940617793333333

 $00:08:52.780 \longrightarrow 00:08:54.418$ Again, these are in regular kids.

NOTE Confidence: 0.940617793333333

 $00:08:54.420 \rightarrow 00:08:57.577$ These are regular kids in regular schools.

NOTE Confidence: 0.940617793333333

 $00{:}08{:}57{.}580 \dashrightarrow 00{:}08{:}59{.}560$ The second thing to know is

NOTE Confidence: 0.940617793333333

 $00:08:59.560 \longrightarrow 00:09:01.438$ that it's genetic, and so again,

NOTE Confidence: 0.940617793333333

 $00:09:01.438 \rightarrow 00:09:03.510$ if we take our distribution of children,

- NOTE Confidence: 0.940617793333333
- $00:09:03.510 \rightarrow 00:09:06.230$ let's say again 4th graders and we do
- NOTE Confidence: 0.940617793333333
- $00:09:06.230 \longrightarrow 00:09:08.088$ say comprehension and we chart them.
- NOTE Confidence: 0.940617793333333
- $00:09:08.090 \dashrightarrow 00:09:09.866$ So we have a normal distribution.
- NOTE Confidence: 0.940617793333333
- $00:09:09.870 \longrightarrow 00:09:11.284$ 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
- $00:09:12.934 \longrightarrow 00:09:14.030$ the mean as well.
- NOTE Confidence: 0.940617793333333
- $00:09:14.030 \longrightarrow 00:09:15.410$ And if we ask the factors,
- NOTE Confidence: 0.940617793333333
- $00:09:15.410 \longrightarrow 00:09:18.315$ ask which factors can account for that
- NOTE Confidence: 0.940617793333333
- $00:09:18.315 \rightarrow 00:09:21.310$ variance and in fact non genetic factors.
- NOTE Confidence: 0.940617793333333
- $00:09:21.310 \longrightarrow 00:09:23.291$ To the surprise of most people actually
- NOTE Confidence: 0.940617793333333
- $00:09:23.291 \rightarrow 00:09:25.209$ account for a very small percent,
- NOTE Confidence: 0.940617793333333
- $00:09:25.210 \longrightarrow 00:09:27.381$ 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
- $00:09:29.105 \longrightarrow 00:09:31.717$ account for the vast majority of
- NOTE Confidence: 0.940617793333333
- $00:09:31.717 \longrightarrow 00:09:33.647$ reading performance or the variance
- NOTE Confidence: 0.940617793333333

 $00:09:33.647 \longrightarrow 00:09:35.842$ around the mean for all of us,

NOTE Confidence: 0.940617793333333

 $00:09:35.842 \rightarrow 00:09:37.390$ 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

 $00:09:38.970 \longrightarrow 00:09:40.800$ because this is what really is

NOTE Confidence: 0.940617793333333

 $00:09:40.800 \longrightarrow 00:09:42.020$ important for our performance

NOTE Confidence: 0.925943195

 $00:09:42.071 \longrightarrow 00:09:42.629$ in reading.

NOTE Confidence: 0.942632043846154

 $00:09:44.670 \longrightarrow 00:09:46.974$ So what we say is that genetic factors

NOTE Confidence: 0.942632043846154

 $00:09:46.974 \rightarrow 00:09:49.543$ account for up to 80% of reading performance,

NOTE Confidence: 0.942632043846154

 $00:09:49.543 \dashrightarrow 00:09:52.369$ and we call this concept heritability.

NOTE Confidence: 0.942632043846154

 $00:09:52.370 \rightarrow 00:09:55.100$ And since genetic factors are mostly

NOTE Confidence: 0.942632043846154

 $00:09:55.100 \longrightarrow 00:09:57.415$ responsible for dyslexia and our

NOTE Confidence: 0.942632043846154

 $00{:}09{:}57{.}415 \dashrightarrow 00{:}09{:}59{.}515$ performance and meeting our past

NOTE Confidence: 0.942632043846154

 $00:09:59.515 \dashrightarrow 00:10:01.690$ was to discover reading genes.

NOTE Confidence: 0.942632043846154

 $00:10:01.690 \longrightarrow 00:10:04.203$ And so to identify these kids at

NOTE Confidence: 0.942632043846154

 $00:10:04.203 \rightarrow 00:10:06.069$ risk when intervention works best,

NOTE Confidence: 0.942632043846154

 $00:10:06.070 \rightarrow 00:10:08.506$ we developed a genetic screening panel.

- NOTE Confidence: 0.942632043846154
- $00:10:08.510 \longrightarrow 00:10:10.770$ We collect saliva from saliva.
- NOTE Confidence: 0.942632043846154
- $00{:}10{:}10{.}770 \dashrightarrow 00{:}10{:}12.858$ We extract genomic DNA and we've
- NOTE Confidence: 0.942632043846154
- $00{:}10{:}12.858 \dashrightarrow 00{:}10{:}14.970$ done these studies in two forms.
- NOTE Confidence: 0.942632043846154
- $00:10:14.970 \longrightarrow 00:10:17.106$ Our first one was about 10 years ago.
- NOTE Confidence: 0.942632043846154
- $00:10:17.110 \longrightarrow 00:10:18.685$ 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
- $00:10:19.670 \longrightarrow 00:10:22.078$ 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
- $00{:}10{:}23.564 \dashrightarrow 00{:}10{:}26.030$ American kids in the United States
- NOTE Confidence: 0.942632043846154
- $00:10:26.030 \rightarrow 00:10:28.444$ using genetics and then more recently
- NOTE Confidence: 0.942632043846154
- $00:10:28.444 \rightarrow 00:10:29.968$ the longitudinal program called
- NOTE Confidence: 0.942632043846154
- $00{:}10{:}29{.}968 \dashrightarrow 00{:}10{:}31{.}891$ 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
- $00:10:34.665 \dashrightarrow 00:10:36.930$ that are European American background,
- NOTE Confidence: 0.942632043846154
- 00:10:36.930 --> 00:10:38.511 Hispanic American background
- NOTE Confidence: 0.942632043846154

 $00:10:38.511 \rightarrow 00:10:40.619$ and African American background.

NOTE Confidence: 0.942632043846154

 $00{:}10{:}40.620 \dashrightarrow 00{:}10{:}42.828$ And we published these in in

NOTE Confidence: 0.942632043846154

 $00:10:42.828 \longrightarrow 00:10:44.720$ 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

 $00{:}10{:}47.065 \dashrightarrow 00{:}10{:}49.505$ journals and that in a very nice very

NOTE Confidence: 0.942632043846154

 $00:10:49.505 \rightarrow 00:10:52.222$ nicely that many of them are reproduced

NOTE Confidence: 0.942632043846154

 $00:10:52.222 \rightarrow 00:10:53.854$ sometimes in other populations,

NOTE Confidence: 0.942632043846154

 $00:10:53.860 \longrightarrow 00:10:56.948$ even in other languages.

NOTE Confidence: 0.942632043846154

 $00:10:56.950 \longrightarrow 00:10:59.860$ So the third thing to know

NOTE Confidence: 0.942632043846154

 $00:10:59.860 \longrightarrow 00:11:01.800$ about reading is that.

NOTE Confidence: 0.942632043846154

 $00{:}11{:}01{.}800 \dashrightarrow 00{:}11{:}04{.}397$ Is that dyslexia can be effectively treated,

NOTE Confidence: 0.942632043846154

 $00{:}11{:}04{.}400 \dashrightarrow 00{:}11{:}06{.}560$ and so let me share with you data

NOTE Confidence: 0.942632043846154

 $00:11:06.560 \rightarrow 00:11:09.145$ from my colleague Maureen Lovett

NOTE Confidence: 0.942632043846154

 $00:11:09.145 \longrightarrow 00:11:12.275$ 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

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

NOTE Confidence: 0.942632043846154

 $00:11:19.280 \longrightarrow 00:11:21.308$ does a very intense intervention that

NOTE Confidence: 0.942632043846154

 $00{:}11{:}21{.}308 \dashrightarrow 00{:}11{:}23{.}894$ lasts for about a year and what she's

NOTE Confidence: 0.942632043846154

 $00{:}11{:}23.894 \dashrightarrow 00{:}11{:}26.324$ done is she's retested them two years

NOTE Confidence: 0.942632043846154

 $00:11:26.324 \rightarrow 00:11:28.314$ after completion of the intervention.

NOTE Confidence: 0.942632043846154

 $00{:}11{:}28{.}320 \dashrightarrow 00{:}11{:}30{.}161$ So these are outcomes 2 years after

NOTE Confidence: 0.942632043846154

 $00{:}11{:}30{.}161 \dashrightarrow 00{:}11{:}31{.}629$ completion of an intervention for

NOTE Confidence: 0.942632043846154

 $00:11:31.629 \dashrightarrow 00:11:33.799$ children that were picked up in grade.

NOTE Confidence: 0.942632043846154

 $00{:}11{:}33{.}800 \dashrightarrow 00{:}11{:}36{.}392$ One children in grade two children

NOTE Confidence: 0.942632043846154

 $00:11:36.392 \longrightarrow 00:11:37.908$ in grade 3/4, etc.

NOTE Confidence: 0.942632043846154

 $00:11:37.908 \longrightarrow 00:11:40.740$ All the way out to grade 12 and what

NOTE Confidence: 0.942632043846154

 $00{:}11{:}40.740 \dashrightarrow 00{:}11{:}42.700$ you can see here pretty obviously is

NOTE Confidence: 0.942632043846154

 $00{:}11{:}42.700 \dashrightarrow 00{:}11{:}44.683$ that these are the kids that perform

NOTE Confidence: 0.942632043846154

 $00{:}11{:}44.683 \dashrightarrow 00{:}11{:}46.739$ the best that are most responsive.

NOTE Confidence: 0.942632043846154

 $00:11:46.740 \longrightarrow 00:11:49.519$ So about 75% of these kids will

 $00:11:49.519 \rightarrow 00:11:51.873$ respond to intervention and will be

NOTE Confidence: 0.942632043846154

 $00:11:51.873 \rightarrow 00:11:54.039$ reading at grade level two years

NOTE Confidence: 0.942632043846154

 $00:11:54.039 \rightarrow 00:11:56.718$ after completion of the intervention.

NOTE Confidence: 0.942632043846154

 $00:11:56.720 \longrightarrow 00:11:57.329$ Whereas in contrast,

NOTE Confidence: 0.942632043846154

 $00{:}11{:}57{.}329 \dashrightarrow 00{:}11{:}58{.}750$ 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

 $00{:}11{:}59{.}840 \dashrightarrow 00{:}12{:}02{.}225$ which is about 50% or so of kids in

NOTE Confidence: 0.942632043846154

 $00:12:02.225 \rightarrow 00:12:04.458$ the United States are picked up.

NOTE Confidence: 0.942632043846154

 $00{:}12{:}04.460 \dashrightarrow 00{:}12{:}06.686$ Was reading disability in high school

NOTE Confidence: 0.942632043846154

 $00:12:06.686 \rightarrow 00:12:09.212$ or later only about 1/4 of those

NOTE Confidence: 0.942632043846154

 $00{:}12{:}09{.}212 \dashrightarrow 00{:}12{:}11{.}162$ kids will actually be respond will

NOTE Confidence: 0.942632043846154

 $00:12:11.162 \rightarrow 00:12:13.395$ be reading it ever brought up to

NOTE Confidence: 0.942632043846154

 $00{:}12{:}13{.}395 \dashrightarrow 00{:}12{:}15{.}505$ grade level or be reading at grade

NOTE Confidence: 0.942632043846154

 $00{:}12{:}15{.}505 \dashrightarrow 00{:}12{:}16{.}980$ level even two years afterwards,

NOTE Confidence: 0.942632043846154

 $00:12:16.980 \longrightarrow 00:12:18.864$ so early identification is

NOTE Confidence: 0.942632043846154

 $00:12:18.864 \rightarrow 00:12:20.277$ obviously really important.

- NOTE Confidence: 0.942632043846154
- $00:12:20.280 \longrightarrow 00:12:21.519$ That's the key.
- NOTE Confidence: 0.942632043846154
- $00:12:21.519 \rightarrow 00:12:23.584$ The key to effective intervention
- NOTE Confidence: 0.942632043846154
- $00:12:23.584 \longrightarrow 00:12:25.560$ is early identification,
- NOTE Confidence: 0.942632043846154
- $00:12:25.560 \rightarrow 00:12:28.654$ but the window of opportunity is narrow.
- NOTE Confidence: 0.942632043846154
- $00:12:28.660 \longrightarrow 00:12:30.520$ So let me show you why.
- NOTE Confidence: 0.942632043846154
- $00:12:30.520 \longrightarrow 00:12:32.335$ 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
- $00:12:33.790 \longrightarrow 00:12:34.840$ and that's in private schools,
- NOTE Confidence: 0.942632043846154
- $00:12:34.840 \longrightarrow 00:12:36.068$ public schools everywhere we
- NOTE Confidence: 0.942632043846154
- $00:12:36.068 \longrightarrow 00:12:38.320$ call it the wait to fail model.
- NOTE Confidence: 0.942632043846154
- $00:12:38.320 \rightarrow 00:12:40.258$ You'll be very familiar with this,
- NOTE Confidence: 0.942632043846154
- $00:12:40.260 \rightarrow 00:12:42.340$ and so this would be typical development of,
- NOTE Confidence: 0.942632043846154
- $00:12:42.340 \longrightarrow 00:12:42.864$ 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
- $00:12:44.960 \longrightarrow 00:12:47.342$ could be spelling of kids of
- NOTE Confidence: 0.942632043846154

- 00:12:47.342 --> 00:12:48.136 typical children,
- NOTE Confidence: 0.890894845714286
- $00{:}12{:}48{.}140 \dashrightarrow 00{:}12{:}49{.}799$ the United States and around the world.
- NOTE Confidence: 0.890894845714286
- $00:12:49.800 \rightarrow 00:12:52.050$ Frankly, in a pre K all the way up through
- NOTE Confidence: 0.890894845714286
- $00{:}12{:}52{.}107 \dashrightarrow 00{:}12{:}54{.}355$ grade five you can see it's nearly linear.
- NOTE Confidence: 0.890894845714286
- $00{:}12{:}54{.}360 \dashrightarrow 00{:}12{:}56{.}370$ The increase in the performance
- NOTE Confidence: 0.890894845714286
- $00{:}12{:}56{.}370 \dashrightarrow 00{:}12{:}57{.}978$ from year to year.
- NOTE Confidence: 0.890894845714286
- $00{:}12{:}57{.}980 \dashrightarrow 00{:}13{:}00{.}514$ But there are children who begin to
- NOTE Confidence: 0.890894845714286
- $00:13:00.514 \longrightarrow 00:13:03.284$ fall off once they are come face to
- NOTE Confidence: 0.890894845714286
- $00{:}13{:}03{.}284 \dashrightarrow 00{:}13{:}04{.}974$ face with a challenging curriculum,
- NOTE Confidence: 0.890894845714286
- $00:13:04.980 \longrightarrow 00:13:06.015$ so this will usually happen
- NOTE Confidence: 0.890894845714286
- $00:13:06.015 \longrightarrow 00:13:07.280$ at the end of grade one,
- NOTE Confidence: 0.890894845714286
- $00:13:07.280 \longrightarrow 00:13:09.165$ definitely in grade 2 where
- NOTE Confidence: 0.890894845714286
- $00:13:09.165 \longrightarrow 00:13:11.410$ they really begin to fall off.
- NOTE Confidence: 0.890894845714286
- $00:13:11.410 \longrightarrow 00:13:12.410$ In the current model,
- NOTE Confidence: 0.890894845714286
- $00:13:12.410 \longrightarrow 00:13:14.430$ what we do is we wait until
- NOTE Confidence: 0.890894845714286
- $00:13:14.430 \rightarrow 00:13:16.246$ they're really performing poorly,

- NOTE Confidence: 0.890894845714286
- $00:13:16.250 \rightarrow 00:13:18.308$ and then we do a standard intervention.
- NOTE Confidence: 0.890894845714286
- $00{:}13{:}18{.}310 \dashrightarrow 00{:}13{:}19{.}525$ And even if the intervention
- NOTE Confidence: 0.890894845714286
- $00:13:19.525 \longrightarrow 00:13:21.053$ is intense and even if they're
- NOTE Confidence: 0.890894845714286
- $00:13:21.053 \rightarrow 00:13:22.607$ young enough to respond to it,
- NOTE Confidence: 0.890894845714286
- $00:13:22.610 \longrightarrow 00:13:25.050$ they never really catch up,
- NOTE Confidence: 0.890894845714286
- $00:13:25.050 \rightarrow 00:13:28.098$ and so this gap is never really bridged.
- NOTE Confidence: 0.890894845714286
- $00:13:28.100 \rightarrow 00:13:30.375$ What we're proposing is a different model.
- NOTE Confidence: 0.890894845714286
- $00:13:30.380 \longrightarrow 00:13:33.204$ What we'd like to do is identify the
- NOTE Confidence: 0.890894845714286
- $00:13:33.204 \rightarrow 00:13:35.324$ kids here early and then track them,
- NOTE Confidence: 0.890894845714286
- $00:13:35.324 \rightarrow 00:13:36.990$ 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
- $00:13:39.940 \longrightarrow 00:13:42.915$ then we can initiate an early intervention,
- NOTE Confidence: 0.890894845714286
- $00:13:42.920 \longrightarrow 00:13:44.840$ and which they would catch up,
- NOTE Confidence: 0.890894845714286
- $00{:}13{:}44{.}840 \dashrightarrow 00{:}13{:}46{.}472$ or at least attain very nearly
- NOTE Confidence: 0.890894845714286
- $00:13:46.472 \longrightarrow 00:13:47.288$ Gray level reading.
- NOTE Confidence: 0.890894845714286

 $00:13:47.290 \longrightarrow 00:13:49.440$ And that is then sustainable.

NOTE Confidence: 0.890894845714286

 $00:13:49.440 \longrightarrow 00:13:53.528$ But the key here is the early identification.

NOTE Confidence: 0.890894845714286

 $00:13:53.530 \longrightarrow 00:13:56.670$ So in in order to do that, that's where.

NOTE Confidence: 0.890894845714286

 $00:13:56.670 \rightarrow 00:13:59.245$ The the identification of genes,

NOTE Confidence: 0.890894845714286

 $00{:}13{:}59{.}250 \dashrightarrow 00{:}14{:}01{.}716$ genetic variants and creation of a

NOTE Confidence: 0.890894845714286

 $00:14:01.716 \rightarrow 00:14:04.309$ genetic screening panel is so important.

NOTE Confidence: 0.890894845714286

 $00:14:04.310 \longrightarrow 00:14:05.348$ So how do we do this?

NOTE Confidence: 0.890894845714286

 $00:14:05.350 \longrightarrow 00:14:07.686$ How do we do this magic of this

NOTE Confidence: 0.890894845714286

 $00:14:07.686 \longrightarrow 00:14:08.270$ early identification?

NOTE Confidence: 0.890894845714286

 $00:14:08.270 \rightarrow 00:14:10.406$ 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

 $00{:}14{:}13.641 \dashrightarrow 00{:}14{:}15.201$ over the last seven years on

NOTE Confidence: 0.890894845714286

 $00{:}14{:}15{.}263 \dashrightarrow 00{:}14{:}16{.}878$ the New Haven Leccinum project.

NOTE Confidence: 0.8298163086666667

 $00:14:19.740 \longrightarrow 00:14:21.940$ You know, hey, the goal in New Haven

NOTE Confidence: 0.8298163086666667

 $00:14:21.940 \rightarrow 00:14:23.705$ election project has been to explore

- NOTE Confidence: 0.8298163086666667
- $00{:}14{:}23.705 \dashrightarrow 00{:}14{:}25.445$ the extent to which genetic variants
- NOTE Confidence: 0.829816308666667
- $00:14:25.505 \rightarrow 00:14:27.580$ correspond with response to intervention
- NOTE Confidence: 0.8298163086666667
- $00:14:27.580 \rightarrow 00:14:29.655$ through whole genome sequence analysis,
- NOTE Confidence: 0.8298163086666667
- $00:14:29.660 \rightarrow 00:14:32.132$ serial behavioral testing and
- NOTE Confidence: 0.8298163086666667
- $00{:}14{:}32{.}132 \dashrightarrow 00{:}14{:}34{.}604$ serial functional MRI studies.
- NOTE Confidence: 0.8298163086666667
- 00:14:34.610 --> 00:14:36.915 It's a longitudinal study of
- NOTE Confidence: 0.8298163086666667
- 00:14:36.915 --> 00:14:38.298 normally developing children.
- NOTE Confidence: 0.829816308666667
- $00{:}14{:}38{.}300 \dashrightarrow 00{:}14{:}40{.}050$ Grades we would enroll children
- NOTE Confidence: 0.8298163086666667
- $00:14:40.050 \longrightarrow 00:14:42.196$ in grades one and follow them
- NOTE Confidence: 0.8298163086666667
- $00:14:42.196 \longrightarrow 00:14:44.176$ all the way through grades five.
- NOTE Confidence: 0.8298163086666667
- $00:14:44.180 \longrightarrow 00:14:45.800$ We recruited these children from
- NOTE Confidence: 0.829816308666667
- 00:14:45.800 --> 00:14:47.420 32 New Haven public schools.
- NOTE Confidence: 0.8298163086666667
- $00:14:47.420 \longrightarrow 00:14:49.180$ These are the regular schools,
- NOTE Confidence: 0.8298163086666667
- $00{:}14{:}49{.}180 \dashrightarrow 00{:}14{:}51{.}791$ not the schools that have children with
- NOTE Confidence: 0.8298163086666667
- $00:14:51.791 \rightarrow 00:14:53.379$ intellectually impaired children in them.
- NOTE Confidence: 0.829816308666667

 $00:14:53.380 \longrightarrow 00:14:55.235$ We recruited about 500 and

NOTE Confidence: 0.8298163086666667

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

NOTE Confidence: 0.8298163086666667

 $00:14:56.720 \rightarrow 00:14:58.885$ these included a parent questionnaire

NOTE Confidence: 0.8298163086666667

 $00:14:58.885 \rightarrow 00:15:02.506$ based on for past medical history in depth

NOTE Confidence: 0.8298163086666667

 $00{:}15{:}02.506 \dashrightarrow 00{:}15{:}04.298$ questions about socioeconomic status,

NOTE Confidence: 0.8298163086666667

 $00:15:04.300 \longrightarrow 00:15:05.572$ learning disability histories,

NOTE Confidence: 0.8298163086666667

 $00:15:05.572 \rightarrow 00:15:09.026$ primary language and spoken in the home, etc.

NOTE Confidence: 0.8298163086666667

 $00{:}15{:}09{.}026 \dashrightarrow 00{:}15{:}12{.}913$ And then for each child we did 30X

NOTE Confidence: 0.8298163086666667

 $00:15:12.913 \rightarrow 00:15:15.328$ whole genome sequencing through saliva.

NOTE Confidence: 0.871081869166667

 $00:15:17.910 \rightarrow 00:15:20.450$ We also did standard psychometric

NOTE Confidence: 0.871081869166667

 $00:15:20.450 \rightarrow 00:15:22.482$ batteries that assess reading

NOTE Confidence: 0.871081869166667

 $00{:}15{:}22.482 \dashrightarrow 00{:}15{:}24.410$ language executive function.

NOTE Confidence: 0.871081869166667

 $00:15:24.410 \longrightarrow 00:15:26.228$ 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

 $00:15:27.925 \rightarrow 00:15:29.909$ 5 and the people who did the executive.

NOTE Confidence: 0.871081869166667

 $00:15:29.910 \rightarrow 00:15:32.003$ These assessments were folks from our group

 $00:15:32.003 \rightarrow 00:15:34.146$ 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

 $00:15:36.490 \longrightarrow 00:15:37.882$ 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

 $00{:}15{:}38{.}810 \dashrightarrow 00{:}15{:}40{.}750$ and we used standard batteries.

NOTE Confidence: 0.871081869166667

 $00{:}15{:}40.750 \dashrightarrow 00{:}15{:}42.686$ So just for giving an example for those

NOTE Confidence: 0.871081869166667

 $00:15:42.686 \rightarrow 00:15:44.905$ of you who are familiar with the field,

NOTE Confidence: 0.871081869166667

 $00:15:44.910 \longrightarrow 00:15:46.690$ these are standard neuro

NOTE Confidence: 0.871081869166667

 $00{:}15{:}46.690 \dashrightarrow 00{:}15{:}48.025$ psychometric testing batteries.

NOTE Confidence: 0.871081869166667

 $00:15:48.030 \longrightarrow 00:15:49.410$ These are not batteries that we

NOTE Confidence: 0.871081869166667

 $00:15:49.410 \longrightarrow 00:15:51.150$ 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

 $00{:}15{:}53{.}375 \dashrightarrow 00{:}15{:}55{.}600$ neuropsychologists to be part of

NOTE Confidence: 0.871081869166667

 $00{:}15{:}55.675 \dashrightarrow 00{:}15{:}58.007$ the educational assessment tool.

NOTE Confidence: 0.871081869166667

 $00{:}15{:}58.010 \dashrightarrow 00{:}16{:}00{.}146$ They include the tower two or the test,

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

NOTE Confidence: 0.871081869166667

 $00{:}16{:}01.870 \dashrightarrow 00{:}16{:}04.450$ from the Woodcock Johnson and subtests

NOTE Confidence: 0.871081869166667

 $00:16:04.511 \rightarrow 00:16:06.287$ from the Grey Oil reading test,

NOTE Confidence: 0.871081869166667

 $00:16:06.290 \rightarrow 00:16:07.965$ and so we actually combined

NOTE Confidence: 0.871081869166667

 $00:16:07.965 \longrightarrow 00:16:09.305$ for the first study.

NOTE Confidence: 0.871081869166667

 $00:16:09.310 \longrightarrow 00:16:13.666$ I'm going to show you to this today is.

NOTE Confidence: 0.871081869166667

 $00:16:13.670 \rightarrow 00:16:16.334$ It's what we call a composite of five

NOTE Confidence: 0.871081869166667

 $00:16:16.334 \rightarrow 00:16:18.830$ subtests from these standardized testing,

NOTE Confidence: 0.871081869166667

 $00:16:18.830 \longrightarrow 00:16:20.769$ the first one is a sight word

NOTE Confidence: 0.871081869166667

 $00:16:20.769 \rightarrow 00:16:22.000$ efficiency from the tower,

NOTE Confidence: 0.871081869166667

 $00{:}16{:}22.000 \dashrightarrow 00{:}16{:}25.208$ where we ask children in a timed manner

NOTE Confidence: 0.871081869166667

 $00:16:25.210 \longrightarrow 00:16:28.524$ to read real words like cat, dog, etc.

NOTE Confidence: 0.871081869166667

 $00{:}16{:}28{.}524 \dashrightarrow 00{:}16{:}31{.}163$ And then we score them for accuracy.

NOTE Confidence: 0.871081869166667

 $00:16:31.170 \longrightarrow 00:16:33.389$ They do it for about 45 seconds,

NOTE Confidence: 0.871081869166667

 $00{:}16{:}33{.}390 \dashrightarrow 00{:}16{:}35{.}136$ 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
- $00:16:36.010 \longrightarrow 00:16:37.970$ It's called and so and so that
- NOTE Confidence: 0.871081869166667
- $00:16:37.970 \longrightarrow 00:16:39.429$ memory doesn't play into this.
- NOTE Confidence: 0.871081869166667
- $00{:}16{:}39{.}430 \dashrightarrow 00{:}16{:}41{.}170$ We actually give them non words.
- NOTE Confidence: 0.871081869166667
- $00:16:41.170 \longrightarrow 00:16:42.334$ Words like zoup.
- NOTE Confidence: 0.871081869166667
- $00:16:42.334 \rightarrow 00:16:45.820$ 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
- $00:16:48.148 \dashrightarrow 00:16:50.519$ 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
- $00:16:54.160 \longrightarrow 00:16:55.798$ and here we score for accuracy.
- NOTE Confidence: 0.871081869166667
- $00:16:55.800 \rightarrow 00:16:57.768$ The number of words they accurately
- NOTE Confidence: 0.871081869166667
- $00{:}16{:}57.768 \dashrightarrow 00{:}16{:}59.180$ get and then the word attack,
- NOTE Confidence: 0.871081869166667
- $00:16:59.180 \longrightarrow 00:17:01.475$ which is again back to non words again to
- NOTE Confidence: 0.871081869166667
- $00{:}17{:}01{.}475 \dashrightarrow 00{:}17{:}04{.}055$ to really look at their ability to decode.
- NOTE Confidence: 0.871081869166667
- $00:17:04.060 \longrightarrow 00:17:05.956$ Also non timed and finally to
- NOTE Confidence: 0.871081869166667

 $00:17:05.956 \rightarrow 00:17:08.023$ look at reading fluency you have

NOTE Confidence: 0.871081869166667

 $00{:}17{:}08{.}023 \dashrightarrow 00{:}17{:}09{.}858$ them read age appropriate passage.

NOTE Confidence: 0.871081869166667

 $00:17:09.860 \longrightarrow 00:17:12.590$ It's time we score for accuracy

NOTE Confidence: 0.871081869166667

 $00:17:12.590 \longrightarrow 00:17:13.955$ but also comprehension.

NOTE Confidence: 0.871081869166667

 $00{:}17{:}13{.}960 \dashrightarrow 00{:}17{:}16{.}468$ So we combine these five subtests.

NOTE Confidence: 0.871081869166667

 $00{:}17{:}16.470 \dashrightarrow 00{:}17{:}18.930$ Into a composite phenotype.

NOTE Confidence: 0.871081869166667

 $00:17:18.930 \longrightarrow 00:17:21.392$ And it's quantitative, that is.

NOTE Confidence: 0.871081869166667

 $00{:}17{:}21.392 \dashrightarrow 00{:}17{:}23.534$ We could score it when we score

NOTE Confidence: 0.871081869166667

 $00{:}17{:}23.534 \dashrightarrow 00{:}17{:}24.770$ it by a number,

NOTE Confidence: 0.871081869166667

 $00:17:24.770 \longrightarrow 00:17:27.050$ so we have high performers

NOTE Confidence: 0.871081869166667

 $00{:}17{:}27{.}050 \dashrightarrow 00{:}17{:}28{.}418$ and low performers.

NOTE Confidence: 0.871081869166667

 $00{:}17{:}28{.}420 \dashrightarrow 00{:}17{:}30{.}618$ And then the trick here is

NOTE Confidence: 0.871081869166667

 $00{:}17{:}30.618 \dashrightarrow 00{:}17{:}33.016$ to relate it to the genetics and

NOTE Confidence: 0.871081869166667

 $00:17:33.016 \longrightarrow 00:17:35.751$ 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

 $00:17:38.139 \longrightarrow 00:17:40.805$ polymorphisms and just to re familiarize

- NOTE Confidence: 0.871081869166667
- $00{:}17{:}40.805 \dashrightarrow 00{:}17{:}42.870$ yourselves with what exactly a
- NOTE Confidence: 0.871081869166667
- $00:17:42.951 \rightarrow 00:17:45.419$ single nucleotide polymorphism is.
- NOTE Confidence: 0.871081869166667
- $00:17:45.420 \rightarrow 00:17:48.924$ I put up this little diagram that is
- NOTE Confidence: 0.871081869166667
- $00{:}17{:}48.924 \dashrightarrow 00{:}17{:}51.582$ diagramming a specific single nucleotide.
- NOTE Confidence: 0.871081869166667
- $00:17:51.582 \rightarrow 00:17:54.558$ 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
- $00{:}17{:}59{.}984 \dashrightarrow 00{:}18{:}03{.}140$ located on chromosome 8 and its
- NOTE Confidence: 0.915173408333333
- $00:18:03.231 \rightarrow 00:18:07.443$ 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
- $00:18:11.575 \longrightarrow 00:18:14.809$ of the short arm of chromosome 8.
- NOTE Confidence: 0.915173408333333
- $00{:}18{:}14{.}810 \dashrightarrow 00{:}18{:}16{.}665$ And here you can see the sequence
- NOTE Confidence: 0.915173408333333
- $00:18:16.665 \longrightarrow 00:18:18.075$ is very specific and because
- NOTE Confidence: 0.915173408333333
- $00:18:18.075 \longrightarrow 00:18:19.743$ all of us carry 2 chromosomes,
- NOTE Confidence: 0.915173408333333
- $00{:}18{:}19.750 \dashrightarrow 00{:}18{:}22.025$ there are two representations of this area
- NOTE Confidence: 0.915173408333333
- $00{:}18{:}22.025 \dashrightarrow 00{:}18{:}24.807$ and of this specific position and person.
- NOTE Confidence: 0.915173408333333

 $00:18:24.810 \longrightarrow 00:18:27.281$ One here is inherited from his mother

NOTE Confidence: 0.915173408333333

 $00{:}18{:}27{.}281 \dashrightarrow 00{:}18{:}30{.}249$ 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

 $00:18:32.266 \rightarrow 00:18:34.357$ that for this snip at this point,

NOTE Confidence: 0.915173408333333

 $00{:}18{:}34{.}360 \dashrightarrow 00{:}18{:}37{.}252$ 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

 $00:18:39.180 \longrightarrow 00:18:41.310$ this person is homozygous for

NOTE Confidence: 0.915173408333333

 $00:18:41.310 \longrightarrow 00:18:43.440$ the C allele or CC.

NOTE Confidence: 0.915173408333333

 $00:18:43.440 \rightarrow 00:18:46.590$ This person I a different person actually

NOTE Confidence: 0.915173408333333

 $00{:}18{:}46.590 \dashrightarrow 00{:}18{:}48.760$ carries AT inherited from the mother

NOTE Confidence: 0.915173408333333

 $00{:}18{:}48.760 \dashrightarrow 00{:}18{:}51.000$ and AT inherited from the father.

NOTE Confidence: 0.915173408333333

 $00:18:51.000 \rightarrow 00:18:53.940$ So therefore this person would be homozygous

NOTE Confidence: 0.915173408333333

 $00{:}18{:}53{.}940 \dashrightarrow 00{:}18{:}57{.}340$ for the teal or TT at this specific snip,

NOTE Confidence: 0.915173408333333

 $00{:}18{:}57{.}340 \dashrightarrow 00{:}18{:}59{.}755$ and then finally we have the heterozygous

NOTE Confidence: 0.915173408333333

 $00:18:59.755 \rightarrow 00:19:01.838$ individual who inherited AC from one parent.

NOTE Confidence: 0.915173408333333

 $00:19:01.840 \longrightarrow 00:19:03.436$ And a T from the other parent.

- NOTE Confidence: 0.915173408333333
- $00{:}19{:}03.440 \dashrightarrow 00{:}19{:}06.194$ 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
- $00{:}19{:}08{.}915 \dashrightarrow 00{:}19{:}11{.}657$ that that this person has one of each.
- NOTE Confidence: 0.915173408333333
- $00:19:11.660 \longrightarrow 00:19:13.256$ So that's what a snip is.
- NOTE Confidence: 0.915173408333333
- $00:19:13.260 \rightarrow 00:19:15.798$ It's just a single nucleotide difference
- NOTE Confidence: 0.915173408333333
- $00:19:15.798 \rightarrow 00:19:19.218$ at a very specific location for everybody.
- NOTE Confidence: 0.915173408333333
- $00:19:19.220 \longrightarrow 00:19:21.831$ So Rs.
- NOTE Confidence: 0.915173408333333
- $00:19:21.831 \longrightarrow 00:19:23.886$ 6935076 that specific location can
- NOTE Confidence: 0.915173408333333
- $00{:}19{:}23.886 \dashrightarrow 00{:}19{:}26.854$ be identified in all of us as well
- NOTE Confidence: 0.915173408333333
- $00:19:26.854 \longrightarrow 00:19:28.732$ 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
- $00{:}19{:}30{.}900 \dashrightarrow 00{:}19{:}33{.}396$ So it does take a look at these
- NOTE Confidence: 0.915173408333333
- $00:19:33.396 \dashrightarrow 00:19:35.634$ three at these three genotypes.
- NOTE Confidence: 0.915173408333333
- $00{:}19{:}35{.}634 \dashrightarrow 00{:}19{:}36{.}596$ The CC,
- NOTE Confidence: 0.915173408333333
- $00{:}19{:}36{.}600 \dashrightarrow 00{:}19{:}38{.}886$ 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
 $\operatorname{-->}$ 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

 $00:19:45.640 \longrightarrow 00:19:48.652$ is then related to performance on

NOTE Confidence: 0.915173408333333

 $00:19:48.652 \rightarrow 00:19:50.660$ the decoding composite phenotype.

NOTE Confidence: 0.915173408333333

 $00:19:50.660 \rightarrow 00:19:53.084$ And So what you can see here is

NOTE Confidence: 0.915173408333333

 $00{:}19{:}53.084 \dashrightarrow 00{:}19{:}56.086$ that the CC in in in a single

NOTE Confidence: 0.915173408333333

 $00:19:56.086 \rightarrow 00:19:58.109$ individual might my correspond with

NOTE Confidence: 0.915173408333333

 $00{:}19{:}58{.}109 \dashrightarrow 00{:}20{:}00{.}473$ low performance and asked sort of

NOTE Confidence: 0.915173408333333

 $00:20:00.473 \rightarrow 00:20:02.836$ in the middle performance and AT& A.

NOTE Confidence: 0.915173408333333

 $00:20:02.836 \longrightarrow 00:20:04.404$ Why, in other words,

NOTE Confidence: 0.915173408333333

 $00:20:04.410 \longrightarrow 00:20:06.734$ it would appear here is that the

NOTE Confidence: 0.915173408333333

 $00{:}20{:}06{.}734 \dashrightarrow 00{:}20{:}09{.}020$ C allele is detrimental and that

NOTE Confidence: 0.915173408333333

 $00:20:09.020 \rightarrow 00:20:11.045$ 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

 $00:20:13.250 \longrightarrow 00:20:16.810$ in this decoding composite.
$00:20:16.810 \longrightarrow 00:20:18.390$ So there's a relationship here.

NOTE Confidence: 0.915173408333333

 $00:20:18.390 \longrightarrow 00:20:20.820$ It's actually a linear relationship.

NOTE Confidence: 0.915173408333333

 $00{:}20{:}20{.}820 \dashrightarrow 00{:}20{:}23{.}900$ More see the worse you do Morty,

NOTE Confidence: 0.915173408333333

 $00:20:23.900 \longrightarrow 00:20:24.936$ the better you do,

NOTE Confidence: 0.915173408333333

 $00{:}20{:}24{.}936 \dashrightarrow 00{:}20{:}27{.}875$ and so if you do this over a lot of

NOTE Confidence: 0.915173408333333

 $00:20:27.875 \rightarrow 00:20:29.525$ individuals then you can actually

NOTE Confidence: 0.915173408333333

 $00{:}20{:}29{.}525 \dashrightarrow 00{:}20{:}31{.}798$ get a coefficient of correlation.

NOTE Confidence: 0.915173408333333

 $00:20:31.800 \rightarrow 00:20:34.335$ The R-squared over those individuals

NOTE Confidence: 0.915173408333333

 $00{:}20{:}34.335 \dashrightarrow 00{:}20{:}37.420$ 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

 $00{:}20{:}39{.}740 \dashrightarrow 00{:}20{:}42{.}194$ And then you can graph that

NOTE Confidence: 0.915173408333333

 $00:20:42.194 \longrightarrow 00:20:44.300$ value for that individual snip.

NOTE Confidence: 0.915173408333333

 $00{:}20{:}44{.}300 \dashrightarrow 00{:}20{:}48{.}236$ 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

 $00{:}20{:}50.724 \dashrightarrow 00{:}20{:}53.710$ million etc on chromosome 8 with a

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

 $00{:}20{:}58.680 \dashrightarrow 00{:}21{:}00{.}144$ on his P value.

NOTE Confidence: 0.915173408333333

 $00:21:00.144 \longrightarrow 00:21:01.242$ The confidence interval

NOTE Confidence: 0.915173408333333

 $00:21:01.242 \longrightarrow 00:21:02.340$ for that relationship.

NOTE Confidence: 0.915173408333333

 $00:21:02.340 \longrightarrow 00:21:02.992$ In fact,

NOTE Confidence: 0.915173408333333

 $00:21:02.992 \longrightarrow 00:21:06.182$ you can do this for a lot of snips

NOTE Confidence: 0.915173408333333

 $00:21:06.182 \longrightarrow 00:21:09.668$ on chromosome 8. Not just one.

NOTE Confidence: 0.915173408333333

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

NOTE Confidence: 0.915173408333333

 $00:21:11.020 \rightarrow 00:21:13.246$ Every one of these dots represents

NOTE Confidence: 0.915173408333333

 $00{:}21{:}13.246 \dashrightarrow 00{:}21{:}14.977$ 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

 $00{:}21{:}17.630 \dashrightarrow 00{:}21{:}19.828$ there are many snips on chromosome 8.

NOTE Confidence: 0.938233537142857

 $00:21:19.830 \longrightarrow 00:21:22.756$ There's well over 10,000, and so after.

NOTE Confidence: 0.938233537142857

 $00:21:22.760 \rightarrow 00:21:25.245$ If you want to present them graphically

 $00{:}21{:}25{.}245 \dashrightarrow 00{:}21{:}27{.}431$ 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

 $00{:}21{:}29{.}472 \dashrightarrow 00{:}21{:}31{.}927$ saturate or paint that chromosome.

NOTE Confidence: 0.938233537142857

 $00{:}21{:}31{.}930 \dashrightarrow 00{:}21{:}35{.}074$ So represented here is every snip that we

NOTE Confidence: 0.938233537142857

 $00:21:35.074 \rightarrow 00:21:37.962$ tested against the composite phenotype for

NOTE Confidence: 0.938233537142857

 $00:21:37.962 \rightarrow 00:21:41.728$ decoding within our cohort of 500 children.

NOTE Confidence: 0.938233537142857

 $00:21:41.730 \rightarrow 00:21:44.664$ 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

 $00:21:49.742 \longrightarrow 00:21:52.826$ All the way out to 22 and you'll

NOTE Confidence: 0.938233537142857

 $00{:}21{:}52.826 \dashrightarrow 00{:}21{:}56.025$ notice that one is the widest because

NOTE Confidence: 0.938233537142857

 $00{:}21{:}56.025 \dashrightarrow 00{:}21{:}58.179$ chromosome one is the longest,

NOTE Confidence: 0.938233537142857

 $00{:}21{:}58{.}180 \dashrightarrow 00{:}22{:}00{.}564$ so it has the most number of snips

NOTE Confidence: 0.938233537142857

 $00{:}22{:}00{.}570 \dashrightarrow 00{:}22{:}03{.}030$ and chromosome 22 is the shortest.

 $00:22:03.030 \dashrightarrow 00:22:05.669$ So has the least number of Snips.

NOTE Confidence: 0.938233537142857

 $00{:}22{:}05{.}670 \dashrightarrow 00{:}22{:}06{.}814$ This is real data.

NOTE Confidence: 0.938233537142857

 $00{:}22{:}06{.}814 \dashrightarrow 00{:}22{:}09{.}365$ This is the real result we call this

NOTE Confidence: 0.938233537142857

 $00:22:09.365 \longrightarrow 00:22:11.657$ for obvious reasons in Manhattan plot.

NOTE Confidence: 0.938233537142857

 $00{:}22{:}11.660 \dashrightarrow 00{:}22{:}13.382$ 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

 $00{:}22{:}14.250 \dashrightarrow 00{:}22{:}17.058$ 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

 $00{:}22{:}20{.}192 \dashrightarrow 00{:}22{:}23{.}715$ by a number of snips in a very small area.

NOTE Confidence: 0.938233537142857

 $00{:}22{:}23.720 \dashrightarrow 00{:}22{:}25.100$ And because of the magic of

NOTE Confidence: 0.938233537142857

 $00:22:25.100 \longrightarrow 00:22:26.020$ the Human Genome Project,

NOTE Confidence: 0.938233537142857

 $00:22:26.020 \rightarrow 00:22:28.765$ we now can tell since we know precisely what

NOTE Confidence: 0.938233537142857

 $00:22:28.765 \rightarrow 00:22:31.547$ the nucleotide number in chromosome it is,

NOTE Confidence: 0.938233537142857

 $00:22:31.550 \longrightarrow 00:22:33.520$ we can identify the gene

NOTE Confidence: 0.938233537142857

 $00:22:33.520 \longrightarrow 00:22:35.096$ that this corresponds to,

NOTE Confidence: 0.938233537142857

 $00{:}22{:}35{.}100 \dashrightarrow 00{:}22{:}37{.}316$ and it corresponds to a gene that was

 $00:22:37.316 \rightarrow 00:22:39.100$ not previously implicated in reading,

NOTE Confidence: 0.938233537142857

 $00:22:39.100 \rightarrow 00:22:41.468$ but which we found to be very strongly

NOTE Confidence: 0.938233537142857

 $00:22:41.468 \rightarrow 00:22:44.556$ have a very strong effect size called Gary.

NOTE Confidence: 0.938233537142857

 $00:22:44.556 \rightarrow 00:22:47.727$ One in our cohort of 500 children.

NOTE Confidence: 0.938233537142857

 $00:22:47.730 \longrightarrow 00:22:49.398$ 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

 $00{:}22{:}51.648 \dashrightarrow 00{:}22{:}54.221$ kids and let's look at four different

NOTE Confidence: 0.938233537142857

 $00:22:54.221 \rightarrow 00:22:56.790$ 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

 $00:23:01.530 \rightarrow 00:23:03.810$ word comprehension, and reading fluency?

NOTE Confidence: 0.938233537142857

 $00{:}23{:}03{.}810 \dashrightarrow 00{:}23{:}04{.}790$ That's the.

NOTE Confidence: 0.938233537142857

 $00{:}23{:}04.790 \dashrightarrow 00{:}23{:}06.750$ That's the paragraph passage.

NOTE Confidence: 0.938233537142857

 $00{:}23{:}06{.}750 \dashrightarrow 00{:}23{:}08{.}894$ 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,

 $00:23:11.150 \longrightarrow 00:23:14.126$ and you can see is that they enter

NOTE Confidence: 0.938233537142857

 $00:23:14.126 \longrightarrow 00:23:16.811$ first grade behind the kids in the

NOTE Confidence: 0.938233537142857

 $00{:}23{:}16.811 \dashrightarrow 00{:}23{:}19.400$ same cohort at the same schools.

NOTE Confidence: 0.938233537142857

 $00:23:19.400 \rightarrow 00:23:22.336$ At the same age in the same grade,

NOTE Confidence: 0.938233537142857

 $00{:}23{:}22{.}340 \dashrightarrow 00{:}23{:}23{.}600$ at at, at, at, at,

NOTE Confidence: 0.938233537142857

 $00{:}23{:}23{.}600 \dashrightarrow 00{:}23{:}24{.}928$ at a significant disadvantage.

NOTE Confidence: 0.938233537142857

 $00{:}23{:}24{.}928 \dashrightarrow 00{:}23{:}27{.}349$ 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

 $00:23:29.210 \rightarrow 00:23:32.129$ you can see they never catch up.

NOTE Confidence: 0.938233537142857

 $00:23:32.130 \longrightarrow 00:23:34.026$ Let me show you what that looks like.

NOTE Confidence: 0.938233537142857

 $00:23:34.030 \rightarrow 00:23:35.566$ This is a comprehension,

NOTE Confidence: 0.938233537142857

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

NOTE Confidence: 0.938233537142857

 $00{:}23{:}35{.}950 \dashrightarrow 00{:}23{:}38{.}310$ a fundamental and important things

NOTE Confidence: 0.938233537142857

 $00:23:38.310 \longrightarrow 00:23:39.192$ skill in reading.

NOTE Confidence: 0.938233537142857

 $00:23:39.192 \longrightarrow 00:23:41.835$ If we look at kids in grade at the

NOTE Confidence: 0.938233537142857

 $00:23:41.835 \longrightarrow 00:23:44.234$ start of grade one at the end of Grade

- NOTE Confidence: 0.938233537142857
- $00{:}23{:}44{.}234 \dashrightarrow 00{:}23{:}46{.}826$ 1 starter grade two end of grade 2 all
- NOTE Confidence: 0.938233537142857
- $00{:}23{:}46.830 \dashrightarrow 00{:}23{:}48.747$ the way up to the start of grade five,
- NOTE Confidence: 0.938233537142857
- $00:23:48.750 \rightarrow 00:23:50.630$ you can see is that children in oak.
- NOTE Confidence: 0.938233537142857
- $00{:}23{:}50{.}630 \dashrightarrow 00{:}23{:}52{.}538$ 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
- $00:23:59.030 \longrightarrow 00:24:00.326$ and it's never really.
- NOTE Confidence: 0.938233537142857
- $00:24:00.326 \longrightarrow 00:24:02.270$ 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
- $00{:}24{:}04{.}470 \dashrightarrow 00{:}24{:}05{.}400$ so it's sustained.
- NOTE Confidence: 0.938233537142857
- $00{:}24{:}05{.}400 \dashrightarrow 00{:}24{:}07{.}980$ 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
- $00:24:13.694 \rightarrow 00:24:15.810$ know this so we looked in the text portal,
- NOTE Confidence: 0.887454495555556

 $00:24:15.810 \rightarrow 00:24:18.704$ 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

 $00:24:20.726 \longrightarrow 00:24:22.529$ 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

 $00:24:24.790 \longrightarrow 00:24:26.320$ It's not surprising that Gary

NOTE Confidence: 0.887454495555556

 $00:24:26.320 \longrightarrow 00:24:27.850$ wins expressed in the brain,

NOTE Confidence: 0.887454495555556

 $00{:}24{:}27.850 \dashrightarrow 00{:}24{:}29.850$ but its strongest expression is

NOTE Confidence: 0.887454495555556

 $00{:}24{:}29.850 \dashrightarrow 00{:}24{:}32.216$ in the cerebellum, the cerebellum

NOTE Confidence: 0.887454495555556

 $00:24:32.216 \rightarrow 00:24:34.548$ hemisphere and total cerebellum.

NOTE Confidence: 0.887454495555556

 $00:24:34.550 \longrightarrow 00:24:35.926$ That was a surprise.

NOTE Confidence: 0.887454495555556

 $00:24:35.926 \rightarrow 00:24:38.419$ But not really that much because what

NOTE Confidence: 0.887454495555556

 $00{:}24{:}38{.}419 \dashrightarrow 00{:}24{:}40{.}960$ we know is that the cerebellum is

NOTE Confidence: 0.887454495555556

 $00:24:40.960 \rightarrow 00:24:43.249$ intimately linked to the cerebral cortex,

NOTE Confidence: 0.887454495555556

 $00{:}24{:}43.250 \dashrightarrow 00{:}24{:}46.622$ the cortical area where there are

NOTE Confidence: 0.887454495555556

 $00{:}24{:}46.622 \dashrightarrow 00{:}24{:}48.870$ specific and specified specialized

NOTE Confidence: 0.887454495555556

 $00:24:48.960 \longrightarrow 00:24:52.403$ reading areas by a circuit or a

- NOTE Confidence: 0.887454495555556
- $00:24:52.403 \rightarrow 00:24:55.007$ cerebellar cerebral cortex loop.
- NOTE Confidence: 0.887454495555556
- $00{:}24{:}55{.}010 \dashrightarrow 00{:}24{:}57{.}222$ This is well known and in fact
- NOTE Confidence: 0.887454495555556
- $00{:}24{:}57{.}222 \dashrightarrow 00{:}24{:}59{.}505$ 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
- $00:25:02.531 \rightarrow 00:25:05.466$ cerebellar theory of reading disability.
- NOTE Confidence: 0.887454495555556
- $00{:}25{:}05{.}470 \dashrightarrow 00{:}25{:}07{.}465$ Nicholson Faucet observed that reading
- NOTE Confidence: 0.887454495555556
- $00:25:07.465 \longrightarrow 00:25:09.460$ disability was also associated with
- NOTE Confidence: 0.887454495555556
- $00{:}25{:}09{.}517 \dashrightarrow 00{:}25{:}11{.}727$ 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
- $00:25:15.270 \rightarrow 00:25:17.925$ optimization and balance,
- NOTE Confidence: 0.887454495555556
- $00:25:17.930 \rightarrow 00:25:20.702$ and so they posited that the cortical
- NOTE Confidence: 0.887454495555556
- $00{:}25{:}20.702 \dashrightarrow 00{:}25{:}22.654$ cerebellar circuit shown here has
- NOTE Confidence: 0.887454495555556
- $00{:}25{:}22.654 \dashrightarrow 00{:}25{:}24.389$ an important role in reading.
- NOTE Confidence: 0.887454495555556
- $00{:}25{:}24{.}390 \dashrightarrow 00{:}25{:}26{.}357$ There has now been a whole lot
- NOTE Confidence: 0.887454495555556
- $00:25:26.357 \longrightarrow 00:25:26.919$ more published.
- NOTE Confidence: 0.887454495555556

 $00:25:26.920 \rightarrow 00:25:28.660$ On the cerebellar theory of reading.

NOTE Confidence: 0.887454495555556

 $00{:}25{:}28.660 \dashrightarrow 00{:}25{:}30.592$ And sometimes some people are in

NOTE Confidence: 0.887454495555556

 $00:25:30.592 \rightarrow 00:25:32.419$ favor and some people are not,

NOTE Confidence: 0.887454495555556

 $00:25:32.420 \rightarrow 00:25:34.535$ 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

 $00:25:36.340 \rightarrow 00:25:38.740$ certainly by association studies,

NOTE Confidence: 0.887454495555556

 $00:25:38.740 \longrightarrow 00:25:40.540$ 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

 $00:25:42.404 \longrightarrow 00:25:44.415$ 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

 $00:25:46.300 \longrightarrow 00:25:48.712$ so let me sort of summarize

NOTE Confidence: 0.887454495555556

 $00:25:48.712 \rightarrow 00:25:49.918$ those briefly here.

NOTE Confidence: 0.887454495555556

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

NOTE Confidence: 0.887454495555556

 $00:25:51.360 \rightarrow 00:25:52.080$ Lexington project,

NOTE Confidence: 0.887454495555556

 $00:25:52.080 \rightarrow 00:25:54.456$ which began to implicate the cerebellum,

NOTE Confidence: 0.887454495555556

 $00:25:54.460 \longrightarrow 00:25:56.735$ actually spurred a number of

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

 $00:26:03.823 \rightarrow 00:26:05.747$ 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

 $00{:}26{:}08.050 \dashrightarrow 00{:}26{:}11.194$ made for a WS to Amazon Web server.

NOTE Confidence: 0.887454495555556

 $00:26:11.200 \longrightarrow 00:26:12.415$ And that's really important because

NOTE Confidence: 0.887454495555556

 $00:26:12.415 \longrightarrow 00:26:13.900$ 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

 $00:26:16.947 \longrightarrow 00:26:19.509$ processed and worked on in an

NOTE Confidence: 0.887454495555556

 $00{:}26{:}19.509 \dashrightarrow 00{:}26{:}21.859$ Amazon Web Services up on the web.

NOTE Confidence: 0.887454495555556

 $00{:}26{:}21.860 \dashrightarrow 00{:}26{:}24.460$ So in this is all cloud based work

NOTE Confidence: 0.887454495555556

 $00{:}26{:}24.460 \dashrightarrow 00{:}26{:}26{.}561$ and Haley actually created this

NOTE Confidence: 0.887454495555556

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

 $00{:}26{:}29{.}309 \dashrightarrow 00{:}26{:}31{.}820$ available as it's free and it's

NOTE Confidence: 0.887454495555556

 $00:26:31.820 \rightarrow 00:26:33.340$ incredibly useful for neuroscientists.

NOTE Confidence: 0.887454495555556

 $00{:}26{:}33{.}340 \dashrightarrow 00{:}26{:}36{.}466$ You know who don't want to get into

NOTE Confidence: 0.887454495555556

 $00:26:36.466 \rightarrow 00:26:38.416$ the specifics of preprocessing and

NOTE Confidence: 0.887454495555556

 $00{:}26{:}38{.}416 \dashrightarrow 00{:}26{:}41{.}440$ 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

 $00:26:43.840 \rightarrow 00:26:46.268$ 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

 $00:26:48.190 \rightarrow 00:26:49.930$ has been working in ABCD.

NOTE Confidence: 0.887454495555556

 $00{:}26{:}49{.}930 \dashrightarrow 00{:}26{:}53{.}872$ ABCD is a longitudinal study of

NOTE Confidence: 0.887454495555556

 $00:26:53.872 \rightarrow 00:26:55.906$ typically developing 10,000 US

NOTE Confidence: 0.887454495555556

 $00{:}26{:}55{.}906 \dashrightarrow 00{:}26{:}58{.}054$ children from across like 32 sites

NOTE Confidence: 0.887454495555556

 $00:26:58.054 \rightarrow 00:27:00.638$ in the United States and they're

NOTE Confidence: 0.887454495555556

 $00{:}27{:}00{.}638 \dashrightarrow 00{:}27{:}02{.}434$ getting cereal imaging studies

NOTE Confidence: 0.887454495555556

 $00:27:02.434 \rightarrow 00:27:04.389$ as well as genotyping.

- NOTE Confidence: 0.887454495555556
- 00:27:04.390 --> 00:27:04.801 Genotyping,
- NOTE Confidence: 0.887454495555556
- $00:27:04.801 \rightarrow 00:27:07.267$ one serial imaging studies and and
- NOTE Confidence: 0.887454495555556
- $00{:}27{:}07{.}267 \dashrightarrow 00{:}27{:}09{.}526$ as and some cognitive assessments
- NOTE Confidence: 0.887454495555556
- $00:27:09.526 \longrightarrow 00:27:11.418$ to the NH Toolbox.
- NOTE Confidence: 0.887454495555556
- $00:27:11.420 \rightarrow 00:27:13.400$ That data is publicly available and
- NOTE Confidence: 0.887454495555556
- $00:27:13.400 \longrightarrow 00:27:15.896$ so with kelson's been doing is he's
- NOTE Confidence: 0.887454495555556
- $00:27:15.896 \rightarrow 00:27:17.751$ 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
- $00:27:20.060 \longrightarrow 00:27:22.076$ and in a way that he's been
- NOTE Confidence: 0.887454495555556
- $00:27:22.076 \rightarrow 00:27:24.388$ using these to create sort of to
- NOTE Confidence: 0.887454495555556
- $00:27:24.388 \rightarrow 00:27:26.446$ leverage our small data set with
- NOTE Confidence: 0.855115656666667
- $00:27:26.522 \rightarrow 00:27:28.640$ a larger data set. This is a theme
- NOTE Confidence: 0.8551156566666667
- $00:27:28.640 \longrightarrow 00:27:30.459$ 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
- $00{:}27{:}36{.}250 \dashrightarrow 00{:}27{:}39{.}577$ our due os is one I just showed you as
- NOTE Confidence: 0.73252445

 $00{:}27{:}39{.}577 \dashrightarrow 00{:}27{:}43{.}097$ 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

 $00{:}27{:}45{.}313 \dashrightarrow 00{:}27{:}48{.}805$ 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

 $00{:}27{:}54.857 \dashrightarrow 00{:}27{:}56.747$ and she uses that information to

NOTE Confidence: 0.73252445

 $00{:}27{:}56.747 \dashrightarrow 00{:}28{:}00.140$ wait the snips for the for the guasa.

NOTE Confidence: 0.73252445

 $00{:}28{:}00{.}140 \dashrightarrow 00{:}28{:}02{.}124$ Therefore it's called that

NOTE Confidence: 0.73252445

 $00:28:02.124 \longrightarrow 00:28:03.116$ was er transcriptome.

NOTE Confidence: 0.73252445

 $00{:}28{:}03{.}120 \dashrightarrow 00{:}28{:}06{.}046$ Wide Association study and she's and and

NOTE Confidence: 0.73252445

 $00{:}28{:}06{.}046 \dashrightarrow 00{:}28{:}08{.}860$ we've been working with helping as well.

NOTE Confidence: 0.73252445

 $00{:}28{:}08{.}860 \dashrightarrow 00{:}28{:}11{.}146$ Helping Zang Kate Connors from the

NOTE Confidence: 0.73252445

 $00{:}28{:}11.146 \dashrightarrow 00{:}28{:}13.363$ group with young Frieders has been

NOTE Confidence: 0.73252445

 $00{:}28{:}13.363 \dashrightarrow 00{:}28{:}15.229$ doing looking at our math data

NOTE Confidence: 0.73252445

 $00:28:15.229 \rightarrow 00:28:16.940$ because I think initially,

- NOTE Confidence: 0.73252445
- $00:28:16.940 \longrightarrow 00:28:18.825$ when I explained how the

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

NOTE Confidence: 0.73252445

 $00:28:19.960 \longrightarrow 00:28:22.010$ we do executive function which

NOTE Confidence: 0.73252445

 $00:28:22.010 \rightarrow 00:28:24.480$ includes attention as well as math,

NOTE Confidence: 0.73252445

 $00{:}28{:}24{.}480 \dashrightarrow 00{:}28{:}25{.}844$ 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

 $00{:}28{:}27{.}957 \dashrightarrow 00{:}28{:}30{.}213$ on math and we'll be hearing some more

NOTE Confidence: 0.73252445

 $00:28:30.213 \rightarrow 00:28:32.784$ data from that in the next couple of years.

NOTE Confidence: 0.73252445

 $00{:}28{:}32.790 \dashrightarrow 00{:}28{:}34.578$ And then finally Steven Penny Agra.

NOTE Confidence: 0.73252445

 $00{:}28{:}34{.}580 \dashrightarrow 00{:}28{:}36{.}800$ His spirit had had a collaboration

NOTE Confidence: 0.73252445

 $00{:}28{:}36{.}800 \dashrightarrow 00{:}28{:}39{.}573$ with Indian Park over the stem Cell

NOTE Confidence: 0.73252445

 $00:28:39.573 \rightarrow 00:28:41.618$ 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

 $00{:}28{:}43.558 \dashrightarrow 00{:}28{:}46.008$ cells and so the idea here being

NOTE Confidence: 0.73252445

 $00:28:46.010 \longrightarrow 00:28:47.270$ is that one of the things that's

- $00:28:47.270 \longrightarrow 00:28:47.810$ really held back.
- NOTE Confidence: 0.73252445
- $00{:}28{:}47.810 \dashrightarrow 00{:}28{:}50.306$ 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
- $00:28:53.430 \longrightarrow 00:28:54.454$ and so unlike cancer,
- NOTE Confidence: 0.73252445
- $00:28:54.454 \longrightarrow 00:28:56.550$ when you can get lots of material,
- NOTE Confidence: 0.73252445
- $00{:}28{:}56{.}550 \dashrightarrow 00{:}28{:}59{.}838$ in fact it's would be difficult.
- NOTE Confidence: 0.73252445
- $00{:}28{:}59{.}840 \dashrightarrow 00{:}29{:}02{.}234$ 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
- $00{:}29{:}05{.}140 \dashrightarrow 00{:}29{:}07{.}060$ 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
- $00:29:09.496 \rightarrow 00:29:12.393$ that what you do is you get human
- NOTE Confidence: 0.73252445
- $00:29:12.393 \longrightarrow 00:29:14.168$ embryonic stem cells and then
- NOTE Confidence: 0.73252445
- $00:29:14.248 \longrightarrow 00:29:17.510$ you begin to develop you.
- NOTE Confidence: 0.73252445
- $00:29:17.510 \longrightarrow 00:29:20.036$ 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
- $00:29:22.410 \longrightarrow 00:29:24.492$ and what Steven has done is

- NOTE Confidence: 0.73252445
- 00:29:24.492 --> 00:29:26.430 he's knocked down using CRISPR.

 $00{:}29{:}26{.}430 \dashrightarrow 00{:}29{:}30{.}516$ 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

 $00:29:35.683 \rightarrow 00:29:37.861$ the cells in a quiessence state,

NOTE Confidence: 0.73252445

 $00{:}29{:}37{.}870 \dashrightarrow 00{:}29{:}40{.}120$ so these are neuronal progenitors

NOTE Confidence: 0.73252445

 $00:29:40.120 \longrightarrow 00:29:42.370$ arrested in a quiescent state.

NOTE Confidence: 0.73252445

 $00{:}29{:}42{.}370 \dashrightarrow 00{:}29{:}44{.}578$ So to analyze that data which you know

NOTE Confidence: 0.73252445

 $00{:}29{:}44.578 \dashrightarrow 00{:}29{:}46.987$ we've been doing a lot of sequencing there,

NOTE Confidence: 0.73252445

 $00:29:46.990 \rightarrow 00:29:47.606$ 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

 $00:29:50.760 \longrightarrow 00:29:52.448$ again from Helping's group and one

NOTE Confidence: 0.73252445

 $00{:}29{:}52{.}448 \dashrightarrow 00{:}29{:}53{.}496$ of our undergraduate students.

NOTE Confidence: 0.73252445

 $00:29:53.500 \rightarrow 00:29:54.499$ Is he Lopez?

 $00:29:54.499 \longrightarrow 00:29:56.497$ So these are things that are

NOTE Confidence: 0.73252445

 $00:29:56.497 \longrightarrow 00:29:57.420$ currently ongoing.

NOTE Confidence: 0.73252445

 $00:29:57.420 \longrightarrow 00:29:58.960$ Major projects in the lab.

NOTE Confidence: 0.73252445

 $00{:}29{:}58{.}960 \dashrightarrow 00{:}30{:}00{.}568$ 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

 $00:30:02.764 \rightarrow 00:30:04.960$ to know that they're going on.

NOTE Confidence: 0.73252445

00:30:04.960 --> 00:30:05.291 OK,

NOTE Confidence: 0.73252445

 $00:30:05.291 \longrightarrow 00:30:07.608$ 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

 $00{:}30{:}12.700 \dashrightarrow 00{:}30{:}14.356$ 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 $\operatorname{-->}$ 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

 $00:30:26.850 \rightarrow 00:30:28.806$ Do we really disrupt the current

00:30:28.806 --> 00:30:29.784 current educational program?

NOTE Confidence: 0.86051457125

 $00{:}30{:}29.790 \dashrightarrow 00{:}30{:}32.000$ Like how to disrupt the

NOTE Confidence: 0.86051457125

 $00:30:32.000 \rightarrow 00:30:33.326$ current educational paradigm?

NOTE Confidence: 0.86051457125

 $00:30:33.330 \rightarrow 00:30:35.818$ 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

 $00:30:38.551 \rightarrow 00:30:40.187$ 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

 $00:30:41.290 \longrightarrow 00:30:43.108$ really an important question for us,

NOTE Confidence: 0.86051457125

 $00{:}30{:}43.110 \dashrightarrow 00{:}30{:}44.886$ because doing our studies

NOTE Confidence: 0.86051457125

 $00:30:44.886 \rightarrow 00:30:46.218$ and publishing them,

NOTE Confidence: 0.86051457125

 $00:30:46.220 \longrightarrow 00:30:48.015$ even publishing them in peer

NOTE Confidence: 0.86051457125

 $00{:}30{:}48.015 \dashrightarrow 00{:}30{:}49.810$ 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

 $00{:}30{:}51{.}190 \dashrightarrow 00{:}30{:}52{.}710$ we've been able to get support for that,

NOTE Confidence: 0.86051457125

 $00{:}30{:}52{.}710$ --> $00{:}30{:}53{.}835$ both private foundation.

 $00{:}30{:}53.835 \dashrightarrow 00{:}30{:}55.335$ Age foundation and do

NOTE Confidence: 0.86051457125

 $00{:}30{:}55{.}335 \dashrightarrow 00{:}30{:}56{.}990$ these really cool studies,

NOTE Confidence: 0.86051457125

 $00:30:56.990 \rightarrow 00:30:58.690$ but are we really moving

NOTE Confidence: 0.86051457125

 $00:30:58.690 \longrightarrow 00:31:00.050$ them into the classroom?

NOTE Confidence: 0.86051457125

00:31:00.050 $\operatorname{-->}$ 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

 $00:31:03.230 \longrightarrow 00:31:05.254$ So if we really want to do this,

NOTE Confidence: 0.86051457125

 $00:31:05.260 \rightarrow 00:31:07.156$ where can we make these changes

NOTE Confidence: 0.86051457125

 $00:31:07.156 \dashrightarrow 00:31:09.290$ so we can translate our findings?

NOTE Confidence: 0.86051457125

 $00{:}31{:}09{.}290 \dashrightarrow 00{:}31{:}11{.}018$ Our ability to identify kids at

NOTE Confidence: 0.86051457125

 $00:31:11.018 \rightarrow 00:31:12.551$ high risk for learning disabilities NOTE Confidence: 0.86051457125

 $00{:}31{:}12.551 \dashrightarrow 00{:}31{:}14.826$ 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

 $00:31:16.230 \longrightarrow 00:31:18.715$ 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

 $00:31:20.410 \longrightarrow 00:31:22.050$ Even in New Haven,

- NOTE Confidence: 0.86051457125
- $00:31:22.050 \rightarrow 00:31:25.210$ across the state of Connecticut or America?
- NOTE Confidence: 0.86051457125
- $00{:}31{:}25{.}210 \dashrightarrow 00{:}31{:}26{.}954$ So to do that,
- NOTE Confidence: 0.86051457125
- $00:31:26.954 \rightarrow 00:31:29.570$ we really need policy level change.
- NOTE Confidence: 0.86051457125
- $00{:}31{:}29{.}570 \dashrightarrow 00{:}31{:}31{.}390$ In the last five years,
- NOTE Confidence: 0.86051457125
- $00{:}31{:}31{.}390 \dashrightarrow 00{:}31{:}33{.}170$ dyslexia and learning disability
- NOTE Confidence: 0.86051457125
- $00:31:33.170 \longrightarrow 00:31:35.840$ policies at the state and federal
- NOTE Confidence: 0.86051457125
- $00:31:35.909 \rightarrow 00:31:38.269$ levels have improved significantly,
- NOTE Confidence: 0.86051457125
- $00:31:38.270 \longrightarrow 00:31:40.724 \text{ most notably in the areas of}$
- NOTE Confidence: 0.86051457125
- $00:31:40.724 \longrightarrow 00:31:42.360$ teacher training and universal
- NOTE Confidence: 0.86051457125
- 00:31:42.430 --> 00:31:44.438 dyslexia screening in grades,
- NOTE Confidence: 0.86051457125
- $00:31:44.440 \longrightarrow 00:31:47.780$ kindergarten through third grade.
- NOTE Confidence: 0.86051457125
- $00{:}31{:}47{.}780 \dashrightarrow 00{:}31{:}50{.}180$ 41 states today have universal
- NOTE Confidence: 0.86051457125
- $00:31:50.180 \rightarrow 00:31:52.580$ 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
- $00{:}31{:}56.070 \dashrightarrow 00{:}31{:}57.799$ 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
- $00:32:03.025 \longrightarrow 00:32:03.540$ when,
- NOTE Confidence: 0.86051457125
- $00:32:03.540 \longrightarrow 00:32:06.023$ when teachers create the iep's,
- NOTE Confidence: 0.86051457125
- $00{:}32{:}06{.}023 \dashrightarrow 00{:}32{:}07{.}292$ the individual educational
- NOTE Confidence: 0.86051457125
- $00{:}32{:}07{.}292 \dashrightarrow 00{:}32{:}09{.}830$ programs that are so important in
- NOTE Confidence: 0.86051457125
- $00{:}32{:}09{.}893 \dashrightarrow 00{:}32{:}12{.}389$ 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
- $00:32:16.664 \rightarrow 00:32:19.548$ list of approved evidence based screeners.
- NOTE Confidence: 0.86051457125
- $00:32:19.550 \longrightarrow 00:32:23.370$ None of them are genetic.
- NOTE Confidence: 0.86051457125
- $00:32:23.370 \longrightarrow 00:32:26.226$ So our goal is to pass legislation
- NOTE Confidence: 0.86051457125
- $00{:}32{:}26{.}226 \dashrightarrow 00{:}32{:}28{.}427$ that includes reliable and validated
- NOTE Confidence: 0.86051457125
- $00{:}32{:}28{.}427 \dashrightarrow 00{:}32{:}31{.}248$ genetic screening for risk of, say,
- NOTE Confidence: 0.86051457125
- $00:32:31.248 \rightarrow 00:32:34.088$ dyslexia or any learning disability.
- NOTE Confidence: 0.86051457125
- $00:32:34.090 \rightarrow 00:32:35.182$ And get it,

 $00:32:35.182 \longrightarrow 00:32:37.366$ 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

 $00:32:39.990 \rightarrow 00:32:42.138$ This would allow parents to screen

NOTE Confidence: 0.86051457125

 $00:32:42.138 \longrightarrow 00:32:44.550$ their child as early as even birth,

NOTE Confidence: 0.86051457125

 $00{:}32{:}44{.}550 \dashrightarrow 00{:}32{:}46{.}209$ but definitely pre K for risk of

NOTE Confidence: 0.86051457125

 $00:32:46.209 \dashrightarrow 00:32:48.189$ any of the learning disabilities,

NOTE Confidence: 0.86051457125

00:32:48.190 --> 00:32:49.062 including dyslexia.

NOTE Confidence: 0.86051457125

 $00:32:49.062 \longrightarrow 00:32:51.242$ It would require school districts

NOTE Confidence: 0.86051457125

 $00{:}32{:}51{.}242 \dashrightarrow 00{:}32{:}53{.}744$ to take those results into account

NOTE Confidence: 0.86051457125

 $00:32:53.744 \rightarrow 00:32:56.000$ when when they create the iips,

NOTE Confidence: 0.86051457125

 $00:32:56.000 \longrightarrow 00:32:57.416$ the individual educational

NOTE Confidence: 0.86051457125

 $00:32:57.416 \longrightarrow 00:33:01.700$ program plans and the 504 plans.

NOTE Confidence: 0.86051457125

 $00{:}33{:}01{.}700 \dashrightarrow 00{:}33{:}03{.}545$ And this would enable children

NOTE Confidence: 0.86051457125

 $00{:}33{:}03{.}545 \dashrightarrow 00{:}33{:}05{.}868$ finally to receive an evidence based

NOTE Confidence: 0.86051457125

00:33:05.868 --> 00:33:07.536 reading instruction or intervention

 $00:33:07.536 \longrightarrow 00:33:09.621$ method at the very earliest

NOTE Confidence: 0.86051457125

 $00{:}33{:}09{.}685 \dashrightarrow 00{:}33{:}11{.}497$ 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

 $00:33:13.910 \rightarrow 00:33:16.890$ and are most likely to work.

NOTE Confidence: 0.86051457125

 $00{:}33{:}16.890 \dashrightarrow 00{:}33{:}19.550$ 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

 $00:33:21.780 \longrightarrow 00:33:24.010$ of information from a number

NOTE Confidence: 0.86051457125

 $00:33:24.092 \rightarrow 00:33:26.400$ 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

 $00{:}33{:}28.630 \dashrightarrow 00{:}33{:}31.330$ 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

 $00{:}33{:}33{.}240 \dashrightarrow 00{:}33{:}35{.}305$ but in fact of learning disabilities and

NOTE Confidence: 0.86051457125

 $00:33:35.305 \rightarrow 00:33:37.301$ it's somewhere in the 10 to 20% range,

NOTE Confidence: 0.86051457125

 $00{:}33{:}37{.}301 \dashrightarrow 00{:}33{:}38{.}865$ I presented an intervention

NOTE Confidence: 0.86051457125

 $00{:}33{:}38.865 \dashrightarrow 00{:}33{:}41.294$ program from my colleague or or

NOTE Confidence: 0.86051457125

 $00{:}33{:}41{.}294 \dashrightarrow 00{:}33{:}43{.}339$ the results of an intervention

- NOTE Confidence: 0.86051457125
- $00:33:43.339 \rightarrow 00:33:44.975$ 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
- $00:33:48.240 \longrightarrow 00:33:49.949$ 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
- $00{:}33{:}51{.}820 \dashrightarrow 00{:}33{:}54{.}915$ it to work and to be and for
- NOTE Confidence: 0.893695270869565
- $00{:}33{:}54{.}915 \dashrightarrow 00{:}33{:}56{.}815$ 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
- $00:33:58.960 \dashrightarrow 00:34:00.312$ both molecular genetic studies
- NOTE Confidence: 0.893695270869565
- $00:34:00.312 \rightarrow 00:34:01.664$ and statistical genetic studies
- NOTE Confidence: 0.893695270869565
- $00:34:01.664 \rightarrow 00:34:03.318$ to show the importance of
- NOTE Confidence: 0.893695270869565
- $00:34:03.318 \rightarrow 00:34:04.858$ 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
- $00{:}34{:}07{.}198 \dashrightarrow 00{:}34{:}09{.}342$ screening to identify kids at high
- NOTE Confidence: 0.893695270869565
- $00:34:09.342 \longrightarrow 00:34:10.774$ risk for attention disorders,
- NOTE Confidence: 0.893695270869565

00:34:10.780 --> 00:34:12.388 reading disabilities,

NOTE Confidence: 0.893695270869565

 $00{:}34{:}12{.}388 \dashrightarrow 00{:}34{:}14{.}800$ language disorders, etc.

NOTE Confidence: 0.893695270869565

 $00{:}34{:}14.800 \dashrightarrow 00{:}34{:}17.008$ And I presented an education paradigm

NOTE Confidence: 0.893695270869565

 $00:34:17.008 \rightarrow 00:34:19.788$ that doesn't work the wait to fail role

NOTE Confidence: 0.893695270869565

 $00{:}34{:}19.788 \dashrightarrow 00{:}34{:}22.100$ 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

 $00:34:24.560 \longrightarrow 00:34:27.940$ policy stuff and so the fact is

NOTE Confidence: 0.893695270869565

 $00:34:27.940 \longrightarrow 00:34:30.440$ is that it's a bit of a mess,

NOTE Confidence: 0.893695270869565

 $00{:}34{:}30{.}440 \dashrightarrow 00{:}34{:}32{.}932$ so to find a form that accommodates

NOTE Confidence: 0.893695270869565

 $00:34:32.932 \rightarrow 00:34:35.144$ the entire mess that I've just

NOTE Confidence: 0.893695270869565

 $00:34:35.144 \rightarrow 00:34:37.636$ 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

 $00:34:40.442 \rightarrow 00:34:42.897$ to unite these seemingly unrelated

NOTE Confidence: 0.893695270869565

 $00:34:42.897 \rightarrow 00:34:45.620$ initiatives under a single umbrella

NOTE Confidence: 0.893695270869565

 $00:34:45.620 \rightarrow 00:34:47.670$ 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
- $00{:}34{:}52{.}750 \dashrightarrow 00{:}34{:}57{.}202$ 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
- $00:35:01.430 \longrightarrow 00:35:04.430$ 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
- $00:35:06.230 \longrightarrow 00:35:09.230$ and genetic and the people
- NOTE Confidence: 0.893695270869565
- $00:35:09.230 \longrightarrow 00:35:11.788$ 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
- $00:35:13.710 \longrightarrow 00:35:15.468$ but neuro psychologists who come in
- NOTE Confidence: 0.893695270869565
- $00{:}35{:}15{.}468 \dashrightarrow 00{:}35{:}17{.}730$ 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
- $00{:}35{:}21{.}530 \dashrightarrow 00{:}35{:}24{.}085$ often not a whole lot about neuroimaging,
- NOTE Confidence: 0.893695270869565

 $00:35:24.090 \longrightarrow 00:35:25.740$ so it's some very important and

NOTE Confidence: 0.893695270869565

 $00{:}35{:}25{.}740 \dashrightarrow 00{:}35{:}27{.}770$ 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

 $00:35:29.225 \rightarrow 00:35:30.900$ we really interact personally.

NOTE Confidence: 0.893695270869565

 $00{:}35{:}30{.}900 \dashrightarrow 00{:}35{:}32{.}760$ Although this year it's been

NOTE Confidence: 0.893695270869565

 $00:35:32.760 \longrightarrow 00:35:34.620$ difficult to interact personally and

NOTE Confidence: 0.893695270869565

 $00{:}35{:}34.678 \dashrightarrow 00{:}35{:}36.596$ so we can inform each other studies

NOTE Confidence: 0.893695270869565

 $00:35:36.596 \rightarrow 00:35:38.475$ and help and work collaboratively

NOTE Confidence: 0.893695270869565

 $00:35:38.475 \dashrightarrow 00:35:40.459$ collaboratively within the lab.

NOTE Confidence: 0.893695270869565

 $00:35:40.460 \dashrightarrow 00:35:42.056$ And I think we've been pretty successful.

NOTE Confidence: 0.893695270869565

 $00{:}35{:}42.060 \dashrightarrow 00{:}35{:}43.224$ I think that's like,

NOTE Confidence: 0.893695270869565

 $00:35:43.224 \rightarrow 00:35:43.806$ for example,

NOTE Confidence: 0.893695270869565

00:35:43.810 - > 00:35:45.340 the study I presented from the

NOTE Confidence: 0.893695270869565

 $00:35:45.340 \longrightarrow 00:35:46.360$ Haven election on project.

NOTE Confidence: 0.893695270869565

 $00{:}35{:}46{.}360 \dashrightarrow 00{:}35{:}49{.}752$ 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
- $00:35:51.520 \dashrightarrow 00:35:53.095$ I didn't show you the neuroimaging data,
- NOTE Confidence: 0.893695270869565
- $00{:}35{:}53{.}100 \dashrightarrow 00{:}35{:}55{.}620$ but it's remarkable how well that works and
- NOTE Confidence: 0.893695270869565
- $00:35:55.620 \rightarrow 00:35:58.265$ 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
- $00:35:58.650 \rightarrow 00:36:01.310$ postdoc in education recently joined the lab.
- NOTE Confidence: 0.893695270869565
- $00{:}36{:}01{.}310 \dashrightarrow 00{:}36{:}02{.}805$ So these are great initiatives
- NOTE Confidence: 0.893695270869565
- $00:36:02.805 \rightarrow 00:36:04.733$ and show how we're really blurring
- NOTE Confidence: 0.893695270869565
- $00{:}36{:}04.733 \dashrightarrow 00{:}36{:}06.977$ 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
- $00:36:11.984 \rightarrow 00:36:14.168$ the gap to other schools to other
- NOTE Confidence: 0.893695270869565
- $00:36:14.236 \longrightarrow 00:36:16.476$ students and the other professional
- NOTE Confidence: 0.893695270869565
- $00{:}36{:}16.476 \dashrightarrow 00{:}36{:}18.268$ schools in the university.
- NOTE Confidence: 0.893695270869565
- $00:36:18.270 \dashrightarrow 00:36:20.223$ So I'm especially proud to say that
- NOTE Confidence: 0.893695270869565

 $00:36:20.223 \rightarrow 00:36:22.384$ 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

 $00:36:23.970 \longrightarrow 00:36:26.634$ and we'll be offering a A1

NOTE Confidence: 0.893695270869565

 $00:36:26.634 \rightarrow 00:36:27.966$ semester long course,

NOTE Confidence: 0.893695270869565

 $00:36:27.970 \longrightarrow 00:36:29.419$ mostly for undergraduates

NOTE Confidence: 0.893695270869565

 $00:36:29.419 \longrightarrow 00:36:30.868$ beginning this fall.

NOTE Confidence: 0.893695270869565

 $00:36:30.870 \rightarrow 00:36:32.838$ This is the first course that they've been.

NOTE Confidence: 0.893695270869565

 $00:36:32.840 \rightarrow 00:36:34.925$ Offering on learning disabilities and

NOTE Confidence: 0.893695270869565

 $00{:}36{:}34{.}925 \dashrightarrow 00{:}36{:}37{.}470$ it's a full I think it's 17 lectures

NOTE Confidence: 0.893695270869565

 $00:36:37.470 \longrightarrow 00:36:39.320$ over the course of the semester,

NOTE Confidence: 0.893695270869565

 $00:36:39.320 \longrightarrow 00:36:41.390$ so this is developed by the

NOTE Confidence: 0.893695270869565

 $00:36:41.390 \longrightarrow 00:36:44.058$ folks in our in our group most.

NOTE Confidence: 0.893695270869565

 $00:36:44.060 \longrightarrow 00:36:45.785$ 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

 $00:36:48.660 \dashrightarrow 00:36:50.676$ 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.

00:36:52.874 --> 00:36:54.820 It looks like it's going to start

NOTE Confidence: 0.943655927692308

 $00:36:54.884 \rightarrow 00:36:56.868$ in the fall. We work really strongly

NOTE Confidence: 0.943655927692308

 $00:36:56.868 \rightarrow 00:36:58.800$ 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

 $00{:}37{:}00{.}780 \dashrightarrow 00{:}37{:}02{.}826$ but they have members from those

NOTE Confidence: 0.943655927692308

 $00:37:02.826 \rightarrow 00:37:05.181$ programs in our lab and plus we

NOTE Confidence: 0.943655927692308

 $00:37:05.181 \rightarrow 00:37:07.337$ present to them on a regular basis.

NOTE Confidence: 0.943655927692308

 $00:37:07.340 \longrightarrow 00:37:09.368$ This is a really extraordinary new

NOTE Confidence: 0.943655927692308

 $00:37:09.368 \dashrightarrow 00:37:12.109$ program here at the School of Management.

NOTE Confidence: 0.943655927692308

 $00{:}37{:}12.110 \dashrightarrow 00{:}37{:}14.367$ It's called the broad center or

NOTE Confidence: 0.943655927692308

 $00{:}37{:}14.367 \dashrightarrow 00{:}37{:}16.152$ the Broad Center for Educational

NOTE Confidence: 0.943655927692308

 $00{:}37{:}16.152 \dashrightarrow 00{:}37{:}17.580$ 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

 $00{:}37{:}19{.}120 \dashrightarrow 00{:}37{:}21{.}088$ I think there are about a dozen broad

NOTE Confidence: 0.943655927692308

 $00{:}37{:}21.088 \dashrightarrow 00{:}37{:}22.838$ Centers for this across the country.

 $00:37:22.840 \longrightarrow 00:37:24.340$ It was just started this past

NOTE Confidence: 0.943655927692308

 $00{:}37{:}24.340 \dashrightarrow 00{:}37{:}25.774$ fall that brings in educational

NOTE Confidence: 0.943655927692308

 $00:37:25.774 \longrightarrow 00:37:27.649$ leaders from around the country.

NOTE Confidence: 0.943655927692308

 $00:37:27.650 \rightarrow 00:37:29.535$ These are superintendents and school

NOTE Confidence: 0.943655927692308

 $00{:}37{:}29{.}535 \dashrightarrow 00{:}37{:}31{.}995$ principals in the largest districts in the

NOTE Confidence: 0.943655927692308

 $00:37:31.995 \rightarrow 00:37:34.398$ United States and they engage in a yearlong,

NOTE Confidence: 0.943655927692308

 $00:37:34.400 \dashrightarrow 00:37:35.480$ transformative leadership

NOTE Confidence: 0.943655927692308

 $00:37:35.480 \rightarrow 00:37:37.640$ program in public education.

NOTE Confidence: 0.943655927692308

 $00:37:37.640 \longrightarrow 00:37:39.446$ And so we're in contact and we're

NOTE Confidence: 0.943655927692308

 $00:37:39.446 \longrightarrow 00:37:40.970$ working with these folks as well.

NOTE Confidence: 0.943655927692308

 $00:37:40.970 \longrightarrow 00:37:41.834$ And then finally,

NOTE Confidence: 0.943655927692308

 $00:37:41.834 \longrightarrow 00:37:42.410$ of course,

NOTE Confidence: 0.943655927692308

 $00:37:42.410 \longrightarrow 00:37:44.222$ 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

 $00{:}37{:}45{.}430 \dashrightarrow 00{:}37{:}47{.}880$ where which is our home base and

NOTE Confidence: 0.943655927692308

 $00:37:47.880 \rightarrow 00:37:50.584$ where we're going to also be reaching

- NOTE Confidence: 0.943655927692308
- $00:37:50.584 \rightarrow 00:37:52.564$ 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
- $00:37:54.270 \longrightarrow 00:37:55.970$ having to learning disabilities
- NOTE Confidence: 0.943655927692308
- $00:37:55.970 \longrightarrow 00:37:57.877$ 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
- $00{:}37{:}59{.}870 \dashrightarrow 00{:}38{:}02{.}458$ 'cause it's so common.
- NOTE Confidence: 0.943655927692308
- $00:38:02.460 \longrightarrow 00:38:04.854$ 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
- $00:38:08.384 \longrightarrow 00:38:09.636$ it's ambitious.
- NOTE Confidence: 0.943655927692308
- $00:38:09.640 \rightarrow 00:38:12.335$ We just got started this past September.
- NOTE Confidence: 0.943655927692308
- $00:38:12.340 \longrightarrow 00:38:13.780$ 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
- $00{:}38{:}15{.}480 \dashrightarrow 00{:}38{:}17{.}538$ and with that I'm happy to take
- NOTE Confidence: 0.943655927692308
- $00{:}38{:}17{.}538 \dashrightarrow 00{:}38{:}19{.}644$ questions and also a big shout out
- NOTE Confidence: 0.943655927692308

 $00:38:19.644 \rightarrow 00:38:21.378$ to all these wonderful people who

NOTE Confidence: 0.943655927692308

 $00{:}38{:}21{.}437 \dashrightarrow 00{:}38{:}23{.}555$ make this sort of research possible,

NOTE Confidence: 0.943655927692308

 $00:38:23.560 \longrightarrow 00:38:25.744$ as well as our funding groups

NOTE Confidence: 0.943655927692308

 $00:38:25.744 \rightarrow 00:38:26.836$ from private foundations,

NOTE Confidence: 0.943655927692308

 $00{:}38{:}26{.}840 \dashrightarrow 00{:}38{:}28{.}465$ them and foundations to the

NOTE Confidence: 0.943655927692308

 $00{:}38{:}28{.}465 \dashrightarrow 00{:}38{:}31{.}040$ NIH as well as to individuals.

NOTE Confidence: 0.943655927692308

 $00:38:31.040 \rightarrow 00:38:32.608$ And of course, thanks to all the children.

NOTE Confidence: 0.943655927692308

 $00{:}38{:}32{.}610 \dashrightarrow 00{:}38{:}34{.}482$ Families who participated in

NOTE Confidence: 0.943655927692308

 $00:38:34.482 \longrightarrow 00:38:35.886$ all these studies.

NOTE Confidence: 0.943655927692308

 $00:38:35.890 \longrightarrow 00:38:37.230$ So if there are questions,

NOTE Confidence: 0.943655927692308

 $00:38:37.230 \longrightarrow 00:38:38.160$ I'm happy to take them.

NOTE Confidence: 0.906592701666667

 $00{:}38{:}43.700 \dashrightarrow 00{:}38{:}45.560$ OK, Jeff, thank you so much.

NOTE Confidence: 0.9065927016666667

00:38:45.560 --> 00:38:46.598 That was amazing.

NOTE Confidence: 0.906592701666667

 $00{:}38{:}46{.}598 \dashrightarrow 00{:}38{:}47{.}636$ That was fantastic.

NOTE Confidence: 0.906592701666667

 $00:38:47.640 \longrightarrow 00:38:49.220$ Now we do have questions.

NOTE Confidence: 0.9065927016666667

00:38:49.220 --> 00:38:51.628 I mean, I invite folks to submit

- NOTE Confidence: 0.9065927016666667
- $00:38:51.628 \rightarrow 00:38:53.837$ questions via the chat or the Q&A,
- NOTE Confidence: 0.9065927016666667
- $00{:}38{:}53{.}840 \dashrightarrow 00{:}38{:}56{.}270$ but we've got some questions already.
- NOTE Confidence: 0.906592701666667
- $00{:}38{:}56{.}270 \dashrightarrow 00{:}38{:}58{.}346$ Doctor Who in one of your
- NOTE Confidence: 0.9065927016666667
- $00:38:58.346 \longrightarrow 00:38:59.730$ earlier slides indicated that
- NOTE Confidence: 0.9065927016666667
- 00:38:59.797 -> 00:39:01.863 heritability for dyslexia is 0.80.
- NOTE Confidence: 0.9065927016666667
- $00:39:01.863 \longrightarrow 00:39:03.681$ 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: 0.9065927016666667
- $00:39:06.080 \rightarrow 00:39:09.320$ Is there a polygenic risk score for dyslexia?
- NOTE Confidence: 0.9065927016666667
- 00:39:09.320 --> 00:39:10.880 If so, how much variance?
- NOTE Confidence: 0.9065927016666667
- $00:39:10.880 \longrightarrow 00:39:11.808$ 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
- $00{:}39{:}13.836 \dashrightarrow 00{:}39{:}17.058$ Thank you for asking so as clearly
- NOTE Confidence: 0.928372473043478
- $00{:}39{:}17.058 \dashrightarrow 00{:}39{:}20.348$ the you know Paul knows is that
- NOTE Confidence: 0.928372473043478
- $00{:}39{:}20{.}348 \dashrightarrow 00{:}39{:}22{.}509$ 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

 $00:39:24.890 \rightarrow 00:39:27.110$ for heritability that you can account for.

NOTE Confidence: 0.928372473043478

00:39:27.110 $\operatorname{-->}$ 00:39:28.922 There's broad sense heritability,

NOTE Confidence: 0.928372473043478

 $00:39:28.922 \rightarrow 00:39:31.187$ and there's narrow sense heritability.

NOTE Confidence: 0.928372473043478

 $00:39:31.190 \longrightarrow 00:39:33.894$ When I say 80%, it's it's broad sense

NOTE Confidence: 0.928372473043478

 $00:39:33.894 \rightarrow 00:39:35.909$ heritability that is when you look

NOTE Confidence: 0.928372473043478

 $00:39:35.909 \dashrightarrow 00:39:37.823$ at twin studies and family studies,

NOTE Confidence: 0.928372473043478

 $00:39:37.830 \longrightarrow 00:39:38.710$ and then you see,

NOTE Confidence: 0.928372473043478

 $00:39:38.710 \rightarrow 00:39:40.030$ and then you ask the question,

NOTE Confidence: 0.928372473043478

 $00:39{:}40.030 \dashrightarrow 00{:}39{:}42.340$ what's the concordance rate between

NOTE Confidence: 0.928372473043478

 $00:39:42.340 \longrightarrow 00:39:44.110$ siblings who are affected, say,

NOTE Confidence: 0.928372473043478

 $00:39:44.110 \longrightarrow 00:39:46.070$ was reading disability in those that aren't,

NOTE Confidence: 0.928372473043478

 $00:39:46.070 \rightarrow 00:39:48.380$ and you compare them the classic

NOTE Confidence: 0.928372473043478

 $00:39:48.380 \rightarrow 00:39:50.232$ example would be identical twins

NOTE Confidence: 0.928372473043478

 $00:39:50.232 \rightarrow 00:39:52.624$ which share 100% of their genome.

NOTE Confidence: 0.928372473043478

 $00:39:52.624 \dashrightarrow 00:39:54.614$ The concordance rate there versus

NOTE Confidence: 0.928372473043478

 $00{:}39{:}54{.}614 \dashrightarrow 00{:}39{:}56{.}508$ the concordance rates and non
00:39:56.508 --> 00:39:58.228 identical twins which only share

NOTE Confidence: 0.928372473043478

 $00:39:58.228 \longrightarrow 00:40:00.220$ on average about 50% and so if

NOTE Confidence: 0.928372473043478

 $00{:}40{:}00{.}220 \dashrightarrow 00{:}40{:}01{.}920$ you do those sorts of those are.

NOTE Confidence: 0.928372473043478

 $00:40:01.920 \longrightarrow 00:40:03.595$ Those are standard heritability studies

NOTE Confidence: 0.928372473043478

 $00{:}40{:}03.595 \dashrightarrow 00{:}40{:}07.126$ in the 1980s and they would say that

NOTE Confidence: 0.928372473043478

 $00:40:07.126 \longrightarrow 00:40:10.000$ the genetic component is about 80%.

NOTE Confidence: 0.928372473043478

 $00:40:10.000 \rightarrow 00:40:13.598$ There has been a polygenic risk score.

NOTE Confidence: 0.928372473043478

 $00:40:13.600 \longrightarrow 00:40:16.664$ 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

 $00:40:19.016 \rightarrow 00:40:21.872$ He has the largest collection of twins,

NOTE Confidence: 0.928372473043478

 $00:40:21.880 \longrightarrow 00:40:24.008$ I think in probably the largest one is

NOTE Confidence: 0.928372473043478

 $00{:}40{:}24.008 \dashrightarrow 00{:}40{:}26.056$ in Australia but he has the largest

NOTE Confidence: 0.928372473043478

 $00{:}40{:}26.056 \dashrightarrow 00{:}40{:}27.516$ one that was reading assessments.

NOTE Confidence: 0.928372473043478

 $00{:}40{:}27{.}520 \dashrightarrow 00{:}40{:}29{.}634$ I think it's 10,000 twins and he

NOTE Confidence: 0.928372473043478

 $00{:}40{:}29.634 \dashrightarrow 00{:}40{:}31.875$ was able to account for all snips

 $00:40:31.875 \longrightarrow 00:40:34.182$ that he looked at and he looked

NOTE Confidence: 0.928372473043478

 $00{:}40{:}34{.}182 \dashrightarrow 00{:}40{:}35{.}897$ 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

 $00:40:38.140 \longrightarrow 00:40:40.252$ He was able to account for

NOTE Confidence: 0.928372473043478

 $00:40:40.252 \longrightarrow 00:40:42.274$ about 8% of the heritability.

NOTE Confidence: 0.928372473043478

 $00:40:42.274 \longrightarrow 00:40:44.026$ This is pretty common

NOTE Confidence: 0.928372473043478

00:40:44.026 --> 00:40:45.340 for polygenic disorders.

NOTE Confidence: 0.928372473043478

 $00:40:45.340 \longrightarrow 00:40:48.090$ 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

 $00{:}40{:}50.780 \dashrightarrow 00{:}40{:}53.168$ which is what's represented and a

NOTE Confidence: 0.928372473043478

 $00:40:53.168 \rightarrow 00:40:54.760$ single nucleotide polymorphism panel,

NOTE Confidence: 0.928372473043478

 $00{:}40{:}54.760 \dashrightarrow 00{:}40{:}56.854$ you generally there's a huge gap

NOTE Confidence: 0.928372473043478

 $00:40:56.854 \rightarrow 00:40:58.250$ between broad sense heritability

NOTE Confidence: 0.928372473043478

00:40:58.308 --> 00:40:59.920 and narrow sense heritability.

NOTE Confidence: 0.928372473043478

 $00:40:59.920 \longrightarrow 00:41:01.624$ 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
- $00:41:07.236 \longrightarrow 00:41:08.939$ 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
- $00:41:11.840 \longrightarrow 00:41:12.980$ 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
- $00:41:15.620 \longrightarrow 00:41:16.628$ 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
- $00{:}41{:}19.049 \dashrightarrow 00{:}41{:}21.449$ 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 dy
scalculia,
- NOTE Confidence: 0.928372473043478
- $00{:}41{:}24.982 \dashrightarrow 00{:}41{:}27.866$ 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
- $00{:}41{:}30{.}243 \dashrightarrow 00{:}41{:}32{.}280$ have the smorg asbord of the right
- NOTE Confidence: 0.928372473043478

 $00:41:32.280 \longrightarrow 00:41:34.182$ variants all at once for that.

NOTE Confidence: 0.928372473043478

 $00{:}41{:}34{.}190 \dashrightarrow 00{:}41{:}35{.}330$ For that to happen,

NOTE Confidence: 0.928372473043478

 $00:41:35.330 \rightarrow 00:41:37.670$ it is rarely a single gene disorder,

NOTE Confidence: 0.928372473043478

 $00:41:37.670 \longrightarrow 00:41:39.755$ although we have been looking

NOTE Confidence: 0.928372473043478

 $00:41:39.755 \rightarrow 00:41:41.006$ at rare variants,

NOTE Confidence: 0.928372473043478

 $00{:}41{:}41.010 \dashrightarrow 00{:}41{:}42.626$ and it does occur from time to time.

NOTE Confidence: 0.928372473043478

 $00:41:42.630 \rightarrow 00:41:43.988$ 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

 $00:41:48.460 \rightarrow 00:41:50.324$ How did you become involved in this research?

NOTE Confidence: 0.71649926975

 $00:41:52.040 \rightarrow 00:41:57.528$ 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

 $00:41:58.950 \longrightarrow 00:42:01.080$ and so he cares about children

NOTE Confidence: 0.71649926975

 $00:42:01.143 \rightarrow 00:42:03.453$ and he cares about reading and he

NOTE Confidence: 0.71649926975

 $00:42:03.453 \rightarrow 00:42:05.380$ got somehow seduced into genetics.

NOTE Confidence: 0.71649926975

 $00:42:05.380 \dashrightarrow 00:42:07.920$ But actually it's the opposite.

NOTE Confidence: 0.71649926975

 $00:42:07.920 \longrightarrow 00:42:09.560$ 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
- $00:42:12.480 \longrightarrow 00:42:15.432$ 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
- $00{:}42{:}17.360 \dashrightarrow 00{:}42{:}18.516$ I actually got first.
- NOTE Confidence: 0.71649926975
- $00{:}42{:}18.516 \dashrightarrow 00{:}42{:}20.897$ Initially I was in cell biology and then
- NOTE Confidence: 0.71649926975
- $00:42:20.897 \rightarrow 00:42:22.955$ I got seduced over to molecular genetics
- NOTE Confidence: 0.71649926975
- $00:42:22.955 \rightarrow 00:42:24.950$ 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
- $00:42:27.490 \longrightarrow 00:42:29.428$ this is a pretty cool thing,
- NOTE Confidence: 0.71649926975
- $00{:}42{:}29{.}430 \dashrightarrow 00{:}42{:}31{.}293$ and so I ended up in a lab that
- NOTE Confidence: 0.71649926975
- $00:42:31.293 \rightarrow 00:42:32.806$ does that was really pioneering
- NOTE Confidence: 0.71649926975
- $00{:}42{:}32.806 \dashrightarrow 00{:}42{:}35.057$ many of the methods for the human
- NOTE Confidence: 0.71649926975
- $00:42:35.057 \rightarrow 00:42:36.687$ Genome project and my first.
- NOTE Confidence: 0.71649926975

 $00:42:36.690 \rightarrow 00:42:39.250$ This was insuring Weismans lab here at Yale,

NOTE Confidence: 0.71649926975

 $00{:}42{:}39{.}250 \dashrightarrow 00{:}42{:}41{.}500$ and at that time what we were doing is

NOTE Confidence: 0.71649926975

 $00:42:41.500 \rightarrow 00:42:43.568$ remember there is no human genome project.

NOTE Confidence: 0.71649926975

 $00:42:43.570 \rightarrow 00:42:45.166$ It was just starting off the ground.

NOTE Confidence: 0.71649926975

 $00:42:45.170 \longrightarrow 00:42:46.555$ 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

 $00:42:47.670 \longrightarrow 00:42:48.990$ and so one of my early

NOTE Confidence: 0.71649926975

 $00:42:48.990 \longrightarrow 00:42:49.870$ projects was the clone.

NOTE Confidence: 0.71649926975

 $00{:}42{:}49{.}870 \dashrightarrow 00{:}42{:}52{.}084$ 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

 $00:42:54.517 \rightarrow 00:42:57.919$ 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

 $00:42:59.720 \longrightarrow 00:43:00.632$ 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

 $00{:}43{:}02{.}152 \dashrightarrow 00{:}43{:}03{.}700$ much about hemochromatosis.

NOTE Confidence: 0.71649926975

 $00{:}43{:}03{.}700 \dashrightarrow 00{:}43{:}06{.}676$ 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
- $00{:}43{:}08{.}300 \dashrightarrow 00{:}43{:}10{.}040$ We we've known that it's genetic
- NOTE Confidence: 0.71649926975
- $00:43:10.040 \longrightarrow 00:43:11.320$ for a long time,
- NOTE Confidence: 0.71649926975
- $00:43:11.320 \longrightarrow 00:43:13.100$ and you've already cloned it.
- NOTE Confidence: 0.71649926975
- $00:43:13.100 \longrightarrow 00:43:14.945$ 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
- $00:43:19.100 \longrightarrow 00:43:20.836$ and so that's how it got started.
- NOTE Confidence: 0.71649926975
- $00{:}43{:}20{.}840 \dashrightarrow 00{:}43{:}22{.}772$ 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
- $00:43:24.060 \longrightarrow 00:43:25.830$ but I had all these resources
- NOTE Confidence: 0.71649926975
- $00:43:25.830 \longrightarrow 00:43:26.715$ for chromosome 6.
- NOTE Confidence: 0.71649926975
- $00{:}43{:}26.720 \dashrightarrow 00{:}43{:}29.480$ I looked around and there was this locus.
- NOTE Confidence: 0.71649926975
- $00{:}43{:}29{.}480 \dashrightarrow 00{:}43{:}31{.}867$ There was this location of a strong
- NOTE Confidence: 0.71649926975
- $00{:}43{:}31{.}867 \dashrightarrow 00{:}43{:}33{.}887$ 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
- $00:43:36.180 \longrightarrow 00:43:38.052$ at that time probably the only
- NOTE Confidence: 0.71649926975
- $00:43:38.052 \rightarrow 00:43:40.003$ 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
- $00{:}43{:}41{.}593 \dashrightarrow 00{:}43{:}43{.}379$ were all the markers were,
- NOTE Confidence: 0.71649926975
- $00:43:43.380 \longrightarrow 00:43:44.946$ 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
- $00{:}43{:}47.740 \dashrightarrow 00{:}43{:}49.405$ 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
- $00{:}43{:}52.112 \dashrightarrow 00{:}43{:}54.127$ but the reason I really jumped into
- NOTE Confidence: 0.71649926975
- $00:43:54.127 \rightarrow 00:43:55.933$ this is 'cause I had a strategic,
- NOTE Confidence: 0.71649926975
- $00:43:55.940 \rightarrow 00:43:56.822$ scientific advantage.
- NOTE Confidence: 0.71649926975
- $00{:}43{:}56.822 \dashrightarrow 00{:}43{:}59.468$ And I took advantage of it.
- NOTE Confidence: 0.912666885
- 00:44:01.390 --> 00:44:05.100 Thank you. From Steve uptegrove.

 $00:44:05.100 \longrightarrow 00:44:06.685$ He even has, unfortunately a well

NOTE Confidence: 0.912666885

 $00:44:06.685 \rightarrow 00:44:08.496$ known history for a high prevalence

NOTE Confidence: 0.912666885

 $00:44:08.496 \rightarrow 00:44:10.335$ 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

 $00{:}44{:}16.080 \dashrightarrow 00{:}44{:}18.418$ This information is not routinely been used

NOTE Confidence: 0.912666885

 $00:44:18.418 \longrightarrow 00:44:21.043$ to identify those at high risk for the

NOTE Confidence: 0.912666885

 $00{:}44{:}21.043 \dashrightarrow 00{:}44{:}22.940$ same disabilities you were concerned with.

NOTE Confidence: 0.912666885

 $00:44:22.940 \longrightarrow 00:44:24.632$ Rather, they come to the light

NOTE Confidence: 0.912666885

 $00:44:24.632 \rightarrow 00:44:26.720$ only by the same weight to fail,

NOTE Confidence: 0.912666885

 $00{:}44{:}26.720 \dashrightarrow 00{:}44{:}29.240$ model the wait to fail model you mentioned.

NOTE Confidence: 0.912666885

 $00:44:29.240 \longrightarrow 00:44:30.944$ What has been lacking are the

NOTE Confidence: 0.912666885

 $00:44:30.944 \rightarrow 00:44:32.538$ resources in schools for particularly

NOTE Confidence: 0.912666885

00:44:32.538 --> 00:44:34.541 districts like New Haven, Kubara,

 $00:44:34.541 \rightarrow 00:44:37.348$ 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

 $00:44:42.820 \rightarrow 00:44:45.004$ you know, reach out to Steve is that

NOTE Confidence: 0.836971998

 $00{:}44{:}45.004 \dashrightarrow 00{:}44{:}47.088$ 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

 $00:44:49.290 \longrightarrow 00:44:51.480$ Steven was one of the earliest

NOTE Confidence: 0.836971998

 $00:44:51.480 \rightarrow 00:44:53.935$ persons that I reached out to because

NOTE Confidence: 0.836971998

 $00{:}44{:}53{.}935 \dashrightarrow 00{:}44{:}56{.}098$ I think at that time Steve you

NOTE Confidence: 0.836971998

 $00:44:56.176 \rightarrow 00:44:57.902$ were either on New Haven School,

NOTE Confidence: 0.836971998

 $00{:}44{:}57{.}902 \dashrightarrow 00{:}45{:}00{.}037$ you were on the school board or you NOTE Confidence: 0.836971998

 $00:45:00.037 \rightarrow 00:45:01.819$ 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

 $00{:}45{:}03.800 \dashrightarrow 00{:}45{:}05.798$ and you were wonderful and I greatly

NOTE Confidence: 0.836971998

 $00{:}45{:}05{.}798 \dashrightarrow 00{:}45{:}07{.}534$ appreciate all the help that you

NOTE Confidence: 0.836971998

 $00:45:07.534 \rightarrow 00:45:09.403$ offered and all the advice that would.

- NOTE Confidence: 0.836971998
- $00:45:09.410 \longrightarrow 00:45:11.606$ Proved to be very, very useful.
- NOTE Confidence: 0.836971998
- $00:45:11.610 \longrightarrow 00:45:14.858$ Second of all is that I'm not
- NOTE Confidence: 0.836971998
- $00{:}45{:}14.858 \dashrightarrow 00{:}45{:}16.574$ discounting the environmental exposures,
- NOTE Confidence: 0.836971998
- $00:45:16.574 \rightarrow 00:45:19.166$ they're huge and they're a big deal,
- NOTE Confidence: 0.836971998
- $00{:}45{:}19{.}170 \dashrightarrow 00{:}45{:}21{.}725$ and they are certainly a big deal
- NOTE Confidence: 0.836971998
- $00{:}45{:}21.725 \dashrightarrow 00{:}45{:}23.310$ to different socioe conomic groups.
- NOTE Confidence: 0.836971998
- $00{:}45{:}23{.}310 \dashrightarrow 00{:}45{:}26{.}054$ I can't answer your your excellent
- NOTE Confidence: 0.836971998
- $00:45:26.054 \rightarrow 00:45:27.959$ question directly because that would
- NOTE Confidence: 0.836971998
- $00:45:27.959 \rightarrow 00:45:30.283$ that would require is probably you know
- NOTE Confidence: 0.836971998
- $00{:}45{:}30{.}283 \dashrightarrow 00{:}45{:}32{.}846$ more lead testing and more documentation,
- NOTE Confidence: 0.836971998
- $00:45:32.850 \longrightarrow 00:45:34.866$ but what I can say is that we've
- NOTE Confidence: 0.836971998
- $00{:}45{:}34.866 \dashrightarrow 00{:}45{:}37.477$ begun as part of the Yale Program
- NOTE Confidence: 0.836971998
- $00{:}45{:}37{.}477 \dashrightarrow 00{:}45{:}39{.}113$ 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
- $00{:}45{:}41.794 \dashrightarrow 00{:}45{:}44.179$ at the electronic medical record we
- NOTE Confidence: 0.836971998

 $00{:}45{:}44.179 \dashrightarrow 00{:}45{:}46.513$ started looking at by just looking

NOTE Confidence: 0.836971998

 $00:45:46.513 \rightarrow 00:45:49.307$ at coding for learning disabilities.

NOTE Confidence: 0.836971998

 $00{:}45{:}49{.}310 \dashrightarrow 00{:}45{:}51{.}524$ And we we're doing this project

NOTE Confidence: 0.836971998

 $00:45:51.524 \rightarrow 00:45:53.000$ collaboratively with Emily Power,

NOTE Confidence: 0.836971998

 $00{:}45{:}53.000 \dashrightarrow 00{:}45{:}55.320$ so so I think we're just starting to

NOTE Confidence: 0.836971998

 $00{:}45{:}55{.}320 \dashrightarrow 00{:}45{:}57{.}759$ get the data at interesting enough.

NOTE Confidence: 0.836971998

 $00:45:57.760 \longrightarrow 00:45:58.492$ Interestingly enough,

NOTE Confidence: 0.836971998

 $00:45:58.492 \rightarrow 00:46:00.322$ we're probably looking right now

NOTE Confidence: 0.836971998

 $00:46:00.322 \longrightarrow 00:46:02.620$ at about 40,000 kids in total,

NOTE Confidence: 0.836971998

 $00:46:02.620 \rightarrow 00:46:04.960$ and amongst the 40,000 kids there.

NOTE Confidence: 0.836971998

 $00{:}46{:}04{.}960 \dashrightarrow 00{:}46{:}07{.}102$ We're looking for codes that would at NOTE Confidence: 0.836971998

 $00:46:07.102 \rightarrow 00:46:09.130$ least implicate some learning disability.

NOTE Confidence: 0.836971998

 $00:46:09.130 \longrightarrow 00:46:11.026$ From there, we'll go on and that is.

NOTE Confidence: 0.836971998

 $00:46:11.030 \rightarrow 00:46:12.745$ We'll try and peel the onion and

NOTE Confidence: 0.836971998

 $00:46:12.745 \longrightarrow 00:46:13.830$ get to be well.

NOTE Confidence: 0.836971998

 $00:46:13.830 \longrightarrow 00:46:15.055$ What is the real learning

- NOTE Confidence: 0.836971998
- $00:46:15.055 \rightarrow 00:46:16.450$ disabilities that they have could be?
- NOTE Confidence: 0.836971998
- $00:46:16.450 \rightarrow 00:46:18.310$ 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
- $00:46:19.081 \longrightarrow 00:46:20.880$ 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
- $00:46:22.715 \longrightarrow 00:46:23.903$ 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
- $00{:}46{:}25.611 \dashrightarrow 00{:}46{:}27.817$ look at lead levels 'cause we can do
- NOTE Confidence: 0.836971998
- $00{:}46{:}27.817 \dashrightarrow 00{:}46{:}29.508$ that in the electronic medical record
- NOTE Confidence: 0.836971998
- $00:46:29.508 \longrightarrow 00:46:31.407$ and we'll try to see if that is a
- NOTE Confidence: 0.836971998
- $00{:}46{:}31.410 \dashrightarrow 00{:}46{:}33.790$ 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
- $00{:}46{:}34{.}994 \dashrightarrow 00{:}46{:}36{.}800$ but I also suspect there correlate
- NOTE Confidence: 0.836971998
- $00:46:36.862 \rightarrow 00:46:38.930$ strongly with socioeconomic status,
- NOTE Confidence: 0.836971998
- $00{:}46{:}38{.}930 \dashrightarrow 00{:}46{:}40{.}538$ which is something I didn't mention
- NOTE Confidence: 0.836971998

 $00:46:40.538 \longrightarrow 00:46:42.290$ in the GWAS that I presented.

NOTE Confidence: 0.836971998

 $00{:}46{:}42.290 \dashrightarrow 00{:}46{:}44.782$ But in that GWAS it is corrected

NOTE Confidence: 0.836971998

 $00:46:44.782 \longrightarrow 00:46:45.850$ for socioe conomic status.

NOTE Confidence: 0.836971998

 $00:46:45.850 \rightarrow 00:46:49.640$ We always do that as well as sex and age,

NOTE Confidence: 0.836971998

 $00{:}46{:}49{.}640 \dashrightarrow 00{:}46{:}51{.}410$ and so that's an important part.

NOTE Confidence: 0.836971998

 $00:46:51.410 \rightarrow 00:46:53.246$ But I'm going to add lead to the list.

NOTE Confidence: 0.836971998

 $00:46:53.250 \longrightarrow 00:46:54.558$ 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

 $00{:}46{:}58{.}200 \dashrightarrow 00{:}46{:}59{.}126$ Truly amazing.

NOTE Confidence: 0.691039984

 $00{:}46{:}59{.}126 \dashrightarrow 00{:}47{:}00{.}978$ You mentioned executive functioning.

NOTE Confidence: 0.691039984

 $00{:}47{:}00{.}980 \dashrightarrow 00{:}47{:}02{.}456$ Any research at the genetic level.

NOTE Confidence: 0.691039984

 $00:47:02.460 \longrightarrow 00:47:04.248$ Here schizophrenics can have

NOTE Confidence: 0.691039984

 $00{:}47{:}04{.}248 \dashrightarrow 00{:}47{:}06{.}483$ excellent verbal and reading skills,

NOTE Confidence: 0.691039984

 $00:47:06.490 \longrightarrow 00:47:09.020$ 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

 $00{:}47{:}13.205 \dashrightarrow 00{:}47{:}15.950$ 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
- $00:47:19.280 \longrightarrow 00:47:22.400$ field to be politically correct.
- NOTE Confidence: 0.875898443846154
- $00{:}47{:}22{.}400 \dashrightarrow 00{:}47{:}25{.}210$ 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
- $00:47:27.276 \longrightarrow 00:47:29.336$ and typically and specifically.
- NOTE Confidence: 0.875898443846154
- $00:47:29.340 \rightarrow 00:47:31.192$ 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
- $00:47:33.510 \longrightarrow 00:47:35.925$ That is, if you have a neuro
- NOTE Confidence: 0.875898443846154
- $00:47:35.925 \longrightarrow 00:47:37.570$ psychosis or even autism.
- NOTE Confidence: 0.875898443846154
- $00:47:37.570 \longrightarrow 00:47:39.042$ We've been excluding those
- NOTE Confidence: 0.875898443846154
- $00:47:39.042 \longrightarrow 00:47:40.514$ children from our studies.
- NOTE Confidence: 0.875898443846154
- $00{:}47{:}40.520 \dashrightarrow 00{:}47{:}42.992$ Really trying to focus on those
- NOTE Confidence: 0.875898443846154
- $00{:}47{:}42.992 \dashrightarrow 00{:}47{:}45.216$ 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
- $00{:}47{:}47{.}208 \dashrightarrow 00{:}47{:}49{.}200$ language or executive function.
- NOTE Confidence: 0.875898443846154

00:47:49.200 --> 00:47:50.745 Having said that,

NOTE Confidence: 0.875898443846154

 $00{:}47{:}50.745 \dashrightarrow 00{:}47{:}53.320$ we have extensive executive function

NOTE Confidence: 0.875898443846154

 $00:47:53.320 \longrightarrow 00:47:56.218$ assessments on all 500 of our kids

NOTE Confidence: 0.875898443846154

 $00:47:56.218 \rightarrow 00:47:58.636$ in our longitudinal study as well as

NOTE Confidence: 0.875898443846154

 $00{:}47{:}58.636 \dashrightarrow 00{:}48{:}00.746$ the 1300 kids in our initial cross

NOTE Confidence: 0.875898443846154

 $00:48:00.746 \rightarrow 00:48:02.619$ sectional study called the Grad study,

NOTE Confidence: 0.875898443846154

 $00{:}48{:}02.620 \dashrightarrow 00{:}48{:}04.555$ 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

 $00{:}48{:}07{.}460 \dashrightarrow 00{:}48{:}09{.}256$ data specifically on attention,

NOTE Confidence: 0.875898443846154

 $00:48:09.260 \longrightarrow 00:48:11.045$ 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

 $00:48:11.560 \rightarrow 00:48:12.416$ Look really,

NOTE Confidence: 0.875898443846154

 $00:48:12.416 \longrightarrow 00:48:13.272$ really good,

NOTE Confidence: 0.875898443846154

 $00:48:13.272 \rightarrow 00:48:16.230$ so I think yes we will have some

NOTE Confidence: 0.875898443846154

 $00{:}48{:}16{.}230 \dashrightarrow 00{:}48{:}17{.}780$ jeans and genetic variants that

NOTE Confidence: 0.875898443846154

 $00:48:17.780 \rightarrow 00:48:20.178$ will correspond beautifully and and

00:48:20.178 --> 00:48:22.098 will identify risk for attention.

NOTE Confidence: 0.875898443846154

 $00:48:22.100 \longrightarrow 00:48:23.772$ I can tell you is that there

NOTE Confidence: 0.875898443846154

 $00:48:23.772 \longrightarrow 00:48:25.696$ are a lot of good people in this

NOTE Confidence: 0.875898443846154

 $00:48:25.696 \longrightarrow 00:48:27.345$ field and a number of handful

NOTE Confidence: 0.875898443846154

 $00{:}48{:}27{.}345 \dashrightarrow 00{:}48{:}29{.}211$ 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

 $00:48:30.528 \longrightarrow 00:48:33.280$ and so I think this is a very

NOTE Confidence: 0.875898443846154

 $00:48:33.355 \longrightarrow 00:48:34.999$ cool area of interest.

NOTE Confidence: 0.875898443846154

 $00:48:35.000 \longrightarrow 00:48:37.110$ We continue to pursue it

NOTE Confidence: 0.875898443846154

 $00:48:37.110 \longrightarrow 00:48:39.360$ and I'll keep you posted I.

NOTE Confidence: 0.875898443846154

 $00:48:39.360 \longrightarrow 00:48:41.628$ I think we'll have something solid.

NOTE Confidence: 0.875898443846154

 $00:48:41.630 \longrightarrow 00:48:43.380$ I'm hoping the manuscript will

NOTE Confidence: 0.875898443846154

 $00:48:43.380 \longrightarrow 00:48:44.780$ go out before June.

NOTE Confidence: 0.795384104

 $00{:}48{:}46.680 \dashrightarrow 00{:}48{:}49.380$ Thanks Jeff from Julia Rosenberg.

NOTE Confidence: 0.795384104

 $00{:}48{:}49{.}380 \dashrightarrow 00{:}48{:}51{.}078$ Thank you for a great talk.

 $00{:}48{:}51{.}080 \dashrightarrow 00{:}48{:}52{.}858$ I'd love to learn if English language

NOTE Confidence: 0.795384104

 $00{:}48{:}52{.}858 \dashrightarrow 00{:}48{:}54{.}453$ learners have been included in these

NOTE Confidence: 0.795384104

 $00{:}48{:}54{.}453 \dashrightarrow 00{:}48{:}56{.}198$ studies in New Haven schools and if NOTE Confidence: 0.795384104

 $00{:}48{:}56{.}198 \dashrightarrow 00{:}48{:}57{.}950$ you have any insight into how some of NOTE Confidence: 0.795384104

 $00:48:58.002 \rightarrow 00:48:59.885$ these findings may factor in for those

NOTE Confidence: 0.795384104

 $00:48:59.885 \rightarrow 00:49:01.639$ who are English language learners.

NOTE Confidence: 0.795384104

00:49:01.640 --> 00:49:02.888 Thank you. Hi

NOTE Confidence: 0.911747908571429

 $00:49:02.900 \longrightarrow 00:49:05.735$ Julia, so the short answer is yes,

NOTE Confidence: 0.911747908571429

 $00{:}49{:}05{.}740 \dashrightarrow 00{:}49{:}06{.}780$ you know there are.

NOTE Confidence: 0.911747908571429

 $00:49:06.780 \longrightarrow 00:49:09.396$ So if you're going to be in New Haven

NOTE Confidence: 0.911747908571429

 $00{:}49{:}09{.}396 \dashrightarrow 00{:}49{:}11{.}276$ public schools, you're going to be.

NOTE Confidence: 0.911747908571429

 $00:49:11.276 \longrightarrow 00:49:12.796$ You're going to have English

NOTE Confidence: 0.911747908571429

 $00:49:12.796 \longrightarrow 00:49:14.576$ language learners. So the.

NOTE Confidence: 0.911747908571429

 $00{:}49{:}14.576 \dashrightarrow 00{:}49{:}19.070$ We for our initial study of the grad study,

NOTE Confidence: 0.911747908571429

 $00:49:19.070 \longrightarrow 00:49:21.280$ we required that so that

NOTE Confidence: 0.911747908571429

 $00:49:21.280 \longrightarrow 00:49:23.490$ was an older age group,

- NOTE Confidence: 0.911747908571429
- $00:49:23.490 \longrightarrow 00:49:26.410$ 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
- $00:49:27.486 \longrightarrow 00:49:29.730$ and we required that they have been at
- NOTE Confidence: 0.911747908571429
- $00:49:29.730 \longrightarrow 00:49:31.725$ least three years in instruction in the
- NOTE Confidence: 0.911747908571429
- $00{:}49{:}31.725 \dashrightarrow 00{:}49{:}33.545$ United States to be in our studies.
- NOTE Confidence: 0.911747908571429
- $00:49:33.550 \longrightarrow 00:49:34.603$ Remember that study?
- NOTE Confidence: 0.911747908571429
- $00:49:34.603 \rightarrow 00:49:36.709$ The grad study was the 1st,
- NOTE Confidence: 0.911747908571429
- $00:49:36.710 \longrightarrow 00:49:39.698$ and remains the only study of
- NOTE Confidence: 0.911747908571429
- $00:49:39.698 \longrightarrow 00:49:41.192$ underrepresented minorities of
- NOTE Confidence: 0.911747908571429
- $00:49:41.192 \longrightarrow 00:49:43.928$ genetics and reading disability effort,
- NOTE Confidence: 0.911747908571429
- $00:49:43.930 \rightarrow 00:49:46.216$ and so, and we identified variants.
- NOTE Confidence: 0.911747908571429
- $00:49:46.220 \rightarrow 00:49:48.212$ Do that and publish variance through
- NOTE Confidence: 0.911747908571429
- $00:49:48.212 \longrightarrow 00:49:50.356$ that and so that was for the grad
- NOTE Confidence: 0.911747908571429
- $00{:}49{:}50{.}356 \dashrightarrow 00{:}49{:}52{.}760$ studies in the haven next rental project.
- NOTE Confidence: 0.911747908571429
- $00:49:52.760 \longrightarrow 00:49:54.572$ We didn't have much.
- NOTE Confidence: 0.911747908571429

 $00:49:54.572 \rightarrow 00:49:56.837$ Basically they could get by

NOTE Confidence: 0.911747908571429

 $00:49:56.837 \rightarrow 00:49:59.440$ with a cursory understanding.

NOTE Confidence: 0.911747908571429

 $00:49:59.440 \longrightarrow 00:50:02.094$ In English we didn't.

NOTE Confidence: 0.911747908571429

 $00:50:02.094 \rightarrow 00:50:04.026$ We didn't offer in the initial

NOTE Confidence: 0.911747908571429

 $00{:}50{:}04.026 \dashrightarrow 00{:}50{:}06.425$ 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

 $00:50:09.416 \rightarrow 00:50:11.990$ 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

 $00:50:14.199 \rightarrow 00:50:16.280$ or Spanish and the New Haven next.

NOTE Confidence: 0.911747908571429

 $00{:}50{:}16.280 \dashrightarrow 00{:}50{:}18.086$ 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

 $00{:}50{:}19.780 \dashrightarrow 00{:}50{:}22.066$ 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

 $00{:}50{:}27{.}730 \dashrightarrow 00{:}50{:}29{.}557$ Do you know why New York and

NOTE Confidence: 0.762341128333333

 $00:50:29.557 \rightarrow 00:50:31.622$ California were two of the states that

 $00:50:31.622 \rightarrow 00:50:33.147$ were not doing dyslexia screening

NOTE Confidence: 0.762341128333333

 $00{:}50{:}33.147 \dashrightarrow 00{:}50{:}34.906$ and any concerns that prenatal

NOTE Confidence: 0.762341128333333

 $00:50:34.906 \rightarrow 00:50:37.000$ screening might be used to terminate.

NOTE Confidence: 0.762341128333333

 $00{:}50{:}37{.}000 \dashrightarrow 00{:}50{:}41{.}220$ 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

 $00:50:43.130 \dashrightarrow 00:50:46.220$ Sorry but I do know that there that

NOTE Confidence: 0.9264122825

 $00:50:46.220 \rightarrow 00:50:47.237$ they haven't passed legislation

NOTE Confidence: 0.9264122825

 $00:50:47.237 \rightarrow 00:50:48.609$ yet for universal screening.

NOTE Confidence: 0.9264122825

 $00{:}50{:}48.610 \dashrightarrow 00{:}50{:}51.058$ I suspect it has a lot to do with

NOTE Confidence: 0.9264122825

 $00:50:51.058 \rightarrow 00:50:53.220$ money and so you know these are

NOTE Confidence: 0.9264122825

 $00:50:53.220 \rightarrow 00:50:54.705$ expensive things, but I don't.

NOTE Confidence: 0.9264122825

 $00{:}50{:}54{.}705 \dashrightarrow 00{:}50{:}56{.}130$ 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

 $00{:}50{:}57{.}066 \dashrightarrow 00{:}50{:}58{.}938$ I get this question a lot.

NOTE Confidence: 0.9264122825

 $00:50:58.940 \rightarrow 00:51:01.151$ People find me, they call me and

 $00:51:01.151 \rightarrow 00:51:03.319$ 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

 $00:51:06.386 \longrightarrow 00:51:07.514$ with children with dyslexia,

NOTE Confidence: 0.9264122825

00:51:07.520 --> 00:51:08.447 I'm a neonatologist,

NOTE Confidence: 0.9264122825

 $00{:}51{:}08{.}447 \dashrightarrow 00{:}51{:}11{.}055$ but I my group does and and and

NOTE Confidence: 0.9264122825

 $00{:}51{:}11.055 \dashrightarrow 00{:}51{:}12.925$ certainly I interact with people

NOTE Confidence: 0.9264122825

 $00{:}51{:}12.925 \dashrightarrow 00{:}51{:}15.787$ from around the world that work with

NOTE Confidence: 0.9264122825

 $00:51:15.787 \rightarrow 00:51:17.519$ children with reading disability

NOTE Confidence: 0.9264122825

 $00{:}51{:}17{.}520 \dashrightarrow 00{:}51{:}18{.}678$ and they tell me two things.

NOTE Confidence: 0.9264122825

 $00:51:18.680 \rightarrow 00:51:21.158$ Yes, they struggle.

NOTE Confidence: 0.9264122825

 $00:51:21.160 \longrightarrow 00:51:22.945$ And they also tell me that a

NOTE Confidence: 0.9264122825

 $00:51:22.945 \longrightarrow 00:51:24.502$ significant number of them have

NOTE Confidence: 0.9264122825

 $00:51:24.502 \rightarrow 00:51:25.966$ other really significant talents.

NOTE Confidence: 0.9264122825

 $00:51:25.970 \longrightarrow 00:51:26.526$ For example,

NOTE Confidence: 0.9264122825

 $00{:}51{:}26{.}526 \dashrightarrow 00{:}51{:}28{.}194$ there's a group that has told

NOTE Confidence: 0.9264122825

 $00:51:28.194 \rightarrow 00:51:29.964$ me that about 20% this is,

 $00{:}51{:}29{.}964 \dashrightarrow 00{:}51{:}32{.}253$ and I've I've heard this from multiple

NOTE Confidence: 0.9264122825

 $00{:}51{:}32{.}253 \dashrightarrow 00{:}51{:}33{.}257$ neuropsychologists that there's

NOTE Confidence: 0.9264122825

 $00{:}51{:}33{.}257 \dashrightarrow 00{:}51{:}35{.}117$ probably somewhere between 10 and 20%

NOTE Confidence: 0.9264122825

 $00:51:35.120 \rightarrow 00:51:37.058$ of kids with really severe dyslexia.

NOTE Confidence: 0.9264122825

 $00{:}51{:}37{.}060 \dashrightarrow 00{:}51{:}39{.}996$ Have this special ability to be able to

NOTE Confidence: 0.9264122825

 $00{:}51{:}39{.}996 \dashrightarrow 00{:}51{:}42{.}787$ see things in three dimensional space.

NOTE Confidence: 0.9264122825

 $00{:}51{:}42.790 \dashrightarrow 00{:}51{:}45.494$ It's really a marvel of ability to do,

NOTE Confidence: 0.9264122825

 $00{:}51{:}45{.}500 \dashrightarrow 00{:}51{:}47{.}680$ and so if you if you look at all these

NOTE Confidence: 0.9264122825

 $00{:}51{:}47{.}739 \dashrightarrow 00{:}51{:}49{.}429$ examples of successes and people

NOTE Confidence: 0.9264122825

 $00{:}51{:}49{.}429 \dashrightarrow 00{:}51{:}51{.}700$ 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

 $00{:}51{:}53{.}455 \dashrightarrow 00{:}51{:}56{.}005$ etc and they they have been tested

NOTE Confidence: 0.9264122825

 $00{:}51{:}56.005 \dashrightarrow 00{:}51{:}58.195$ 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

 $00:51:59.760 \longrightarrow 00:52:00.800$ want to exclude them?

 $00:52:00.800 \longrightarrow 00:52:02.205$ Why would you want to

NOTE Confidence: 0.9264122825

 $00:52:02.205 \rightarrow 00:52:03.329$ do an early termination?

NOTE Confidence: 0.9264122825

 $00:52:03.330 \longrightarrow 00:52:06.364$ So I do my very best to when people

NOTE Confidence: 0.9264122825

 $00:52:06.364 \rightarrow 00:52:08.513$ call and I think I've been pretty

NOTE Confidence: 0.9264122825

 $00:52:08.513 \longrightarrow 00:52:09.934$ convincing is that this would

NOTE Confidence: 0.9264122825

 $00:52:09.934 \rightarrow 00:52:11.512$ 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

 $00:52:13.888 \longrightarrow 00:52:16.593$ 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

 $00:52:18.225 \longrightarrow 00:52:20.418$ it makes no sense whatsoever.

NOTE Confidence: 0.9264122825

 $00{:}52{:}20{.}420 \dashrightarrow 00{:}52{:}22{.}202$ These kids are.

NOTE Confidence: 0.9264122825

00:52:22.202 --> 00:52:23.390 Are phenomenal,

NOTE Confidence: 0.9264122825

 $00{:}52{:}23{.}390 \dashrightarrow 00{:}52{:}25{.}352$ and they turn into phenomenal adults

NOTE Confidence: 0.9264122825

 $00:52:25.352 \rightarrow 00:52:27.310$ and incredibly happy and productive.

NOTE Confidence: 0.9264122825

 $00:52:27.310 \longrightarrow 00:52:28.850$ They work hard, they struggle.

NOTE Confidence: 0.9264122825

 $00:52:28.850 \rightarrow 00:52:30.524$ There's no question about it and

- NOTE Confidence: 0.9264122825
- $00:52:30.524 \rightarrow 00:52:31.930$ their parents struggle as well,

 $00:52:31.930 \longrightarrow 00:52:34.348$ but they do universally, really well.

NOTE Confidence: 0.950234177142857

 $00:52:35.720 \rightarrow 00:52:38.574$ Well, I think that these kids also may

NOTE Confidence: 0.950234177142857

 $00:52:38.574 \longrightarrow 00:52:40.212$ have an even brighter future based on

NOTE Confidence: 0.950234177142857

 $00:52:40.212 \longrightarrow 00:52:42.020$ some of the work you've been doing.

NOTE Confidence: 0.950234177142857

 $00{:}52{:}42.020 \dashrightarrow 00{:}52{:}44.589$ Jeff, I mean the the ability to

NOTE Confidence: 0.950234177142857

 $00:52:44.589 \longrightarrow 00:52:46.471$ identify these kids early and

NOTE Confidence: 0.950234177142857

 $00:52:46.471 \rightarrow 00:52:48.577$ really change a lot of lives.

NOTE Confidence: 0.950234177142857

 $00:52:48.580 \longrightarrow 00:52:50.560$ I have a from auto Phoenix.

NOTE Confidence: 0.950234177142857

 $00{:}52{:}50{.}560 \dashrightarrow 00{:}52{:}52{.}590$ Ask says this is fascinating and so

NOTE Confidence: 0.950234177142857

 $00{:}52{:}52{.}590 \dashrightarrow 00{:}52{:}54{.}401$ so important that I'm thrilled that

NOTE Confidence: 0.950234177142857

 $00{:}52{:}54{.}401 \dashrightarrow 00{:}52{:}56{.}466$ 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

 $00{:}52{:}58.622 \dashrightarrow 00{:}53{:}00.577$ reading failure is language delay.

NOTE Confidence: 0.950234177142857

 $00{:}53{:}00{.}580 \dashrightarrow 00{:}53{:}03{.}110$ Does any of the data point to a way to

 $00:53:03.180 \longrightarrow 00:53:05.610$ screen genetically for this in order

NOTE Confidence: 0.950234177142857

 $00:53:05.610 \rightarrow 00:53:07.980$ to intervene even before school age?

NOTE Confidence: 0.950234177142857

 $00:53:07.980 \rightarrow 00:53:09.432$ If we could do newborn screening

NOTE Confidence: 0.950234177142857

 $00:53:09.432 \longrightarrow 00:53:10.158$ for language delay,

NOTE Confidence: 0.950234177142857

 $00:53:10.160 \longrightarrow 00:53:11.580$ we could start early

NOTE Confidence: 0.950234177142857

 $00:53:11.580 \longrightarrow 00:53:12.290$ 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

 $00{:}53{:}15{.}510 \dashrightarrow 00{:}53{:}17{.}754$ 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

 $00:53:26.088 \rightarrow 00:53:28.104$ you do a really careful history on

NOTE Confidence: 0.884992815

 $00:53:28.104 \rightarrow 00:53:29.820$ children with reading disability,

NOTE Confidence: 0.884992815

 $00{:}53{:}29{.}820 \dashrightarrow 00{:}53{:}33{.}588$ 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

 $00:53:35.780 \longrightarrow 00:53:37.836$ 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
- $00:53:40.146 \longrightarrow 00:53:41.886$ about typically developing children.
- NOTE Confidence: 0.884992815
- $00:53:41.890 \rightarrow 00:53:44.263$ Children with normal IQ's, but if they're
- NOTE Confidence: 0.884992815
- $00:53:44.263 \rightarrow 00:53:46.059$ 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
- $00:53:46.940 \longrightarrow 00:53:48.116$ 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
- $00:53:49.640 \longrightarrow 00:53:51.626$ you'll find that roughly a third
- NOTE Confidence: 0.884992815
- $00:53:51.626 \longrightarrow 00:53:52.619$ of those kids.
- NOTE Confidence: 0.884992815
- 00:53:52.620 --> 00:53:54.270 Well, it had language impairment,
- NOTE Confidence: 0.884992815
- $00:53:54.270 \longrightarrow 00:53:55.954$ delayed onset and speech.
- NOTE Confidence: 0.884992815
- $00{:}53{:}55{.}954 \dashrightarrow 00{:}53{:}57{.}414$ 18 months, 22 months,
- NOTE Confidence: 0.884992815
- $00:53:57.414 \rightarrow 00:53:59.256$ 24 months even older than that,
- NOTE Confidence: 0.884992815
- $00{:}53{:}59{.}260 \dashrightarrow 00{:}54{:}01{.}241$ there is a significant overlap and when
- NOTE Confidence: 0.884992815
- $00{:}54{:}01{.}241 \dashrightarrow 00{:}54{:}03{.}676$ we look at the genetic association of
- NOTE Confidence: 0.884992815

 $00:54:03.676 \rightarrow 00:54:05.576$ 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

 $00{:}54{:}07{.}845 \dashrightarrow 00{:}54{:}09{.}682$ you and you use those as candidate

NOTE Confidence: 0.884992815

 $00:54:09.682 \rightarrow 00:54:10.997$ genes for looking at language,

NOTE Confidence: 0.884992815

 $00:54:11.000 \longrightarrow 00:54:12.680$ they overlap a great deal.

NOTE Confidence: 0.884992815

 $00:54:12.680 \rightarrow 00:54:14.564$ There are some unique genes specifically

NOTE Confidence: 0.884992815

 $00:54:14.564 \rightarrow 00:54:16.212$ 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

 $00:54:18.600 \rightarrow 00:54:20.340$ but the overlap is significant

NOTE Confidence: 0.884992815

 $00{:}54{:}20{.}340 \dashrightarrow 00{:}54{:}22{.}651$ and that can explain why there's

NOTE Confidence: 0.884992815

 $00{:}54{:}22.651 \dashrightarrow 00{:}54{:}24.169$ the shared heritability.

NOTE Confidence: 0.884992815

 $00:54:24.170 \longrightarrow 00:54:26.151$ 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

 $00:54:29.250 \longrightarrow 00:54:29.646$ again,

 $00:54:29.646 \rightarrow 00:54:32.162$ about 20 to 30% of those kids will

NOTE Confidence: 0.884992815

 $00{:}54{:}32{.}162 \dashrightarrow 00{:}54{:}34{.}137$ 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

 $00{:}54{:}35{.}950 \dashrightarrow 00{:}54{:}37{.}732$ have reading disability so those kids

NOTE Confidence: 0.884992815

 $00:54:37.732 \longrightarrow 00:54:40.046$ have to be very carefully watched as

NOTE Confidence: 0.884992815

 $00{:}54{:}40.046 \dashrightarrow 00{:}54{:}42.554$ far as new born screening is concerned.

NOTE Confidence: 0.884992815

 $00:54:42.560 \rightarrow 00:54:45.552$ When we ask the question a few years ago,

NOTE Confidence: 0.884992815

 $00:54:45.552 \rightarrow 00:54:47.340$ how many tests in a newborn

NOTE Confidence: 0.884992815

 $00:54:47.416 \longrightarrow 00:54:49.246$ screening were done by DNA?

NOTE Confidence: 0.884992815

 $00:54:49.250 \longrightarrow 00:54:51.202$ The answer was zero.

NOTE Confidence: 0.884992815

00:54:51.202 --> 00:54:52.666 That's slowly changing,

NOTE Confidence: 0.884992815

 $00{:}54{:}52{.}670 \dashrightarrow 00{:}54{:}54{.}502$ and so DNA screening.

NOTE Confidence: 0.884992815

 $00:54:54.502 \rightarrow 00:54:57.100$ Not only is it potentially

NOTE Confidence: 0.884992815

 $00{:}54{:}57{.}100 \dashrightarrow 00{:}55{:}00{.}140$ incredibly sensitive and specific,

NOTE Confidence: 0.884992815

 $00:55:00.140 \longrightarrow 00:55:01.072$ it's scaleable.

 $00:55:01.072 \rightarrow 00:55:04.334$ That means the cost can be incredibly

NOTE Confidence: 0.884992815

 $00{:}55{:}04{.}334 \dashrightarrow 00{:}55{:}07{.}418$ low and so that's what the hope is,

NOTE Confidence: 0.884992815

 $00:55:07.420 \rightarrow 00:55:10.516$ and so we're pursuing various ways

NOTE Confidence: 0.884992815

 $00:55:10.520 \longrightarrow 00:55:13.474$ to get states to think about this,

NOTE Confidence: 0.884992815

 $00{:}55{:}13.480 \dashrightarrow 00{:}55{:}14.964$ or at least to fund this at

NOTE Confidence: 0.884992815

 $00:55:14.964 \rightarrow 00:55:16.449$ 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

 $00:55:17.880 \longrightarrow 00:55:18.910$ That's what we're trying to do.

NOTE Confidence: 0.76731277

 $00{:}55{:}20{.}920 \dashrightarrow 00{:}55{:}22{.}544$ 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

 $00:55:24.170 \longrightarrow 00:55:25.385$ Singer exciting work.

NOTE Confidence: 0.784843681428571

 $00{:}55{:}25{.}390 \dashrightarrow 00{:}55{:}26{.}830$ Have you moved the genetic testing

NOTE Confidence: 0.784843681428571

 $00{:}55{:}26.830 \dashrightarrow 00{:}55{:}28.962$ to the point of the test that has

NOTE Confidence: 0.784843681428571

 $00:55:28.962 \rightarrow 00:55:30.357$ a receiver operating curve that

NOTE Confidence: 0.784843681428571

 $00{:}55{:}30{.}357 \dashrightarrow 00{:}55{:}31{.}650$ provides data on sensitivity,

NOTE Confidence: 0.784843681428571

 $00{:}55{:}31.650 \dashrightarrow 00{:}55{:}33.375$ specificity, positive predictive

- NOTE Confidence: 0.784843681428571
- $00:55:33.375 \rightarrow 00:55:36.250$ value and negative predictive value.
- NOTE Confidence: 0.784843681428571
- $00:55:36.250 \rightarrow 00:55:38.538$ That's well, let me finish the question here.
- NOTE Confidence: 0.784843681428571
- $00{:}55{:}38{.}540 \dashrightarrow 00{:}55{:}40{.}472$ Hold on to that since kids with
- NOTE Confidence: 0.784843681428571
- $00:55:40.472 \dashrightarrow 00:55:42.569$ dyslexia are a heterogeneous group,
- NOTE Confidence: 0.784843681428571
- $00{:}55{:}42{.}570 \dashrightarrow 00{:}55{:}44{.}698$ does your work focus on the most common
- NOTE Confidence: 0.784843681428571
- $00{:}55{:}44.698 \dashrightarrow 00{:}55{:}46.470$ phenotype of phonological awareness,
- NOTE Confidence: 0.784843681428571
- $00:55:46.470 \longrightarrow 00:55:48.899$ or do you have data on the
- NOTE Confidence: 0.784843681428571
- $00:55:48.899 \longrightarrow 00:55:49.593$ 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
- $00:55:52.377 \longrightarrow 00:55:53.820$ part of the question. First.
- NOTE Confidence: 0.872389497272727
- $00:55:53.820 \rightarrow 00:55:55.320$ Joe, it's a great question.
- NOTE Confidence: 0.872389497272727
- $00{:}55{:}55{.}320 \dashrightarrow 00{:}55{:}56{.}588$ Short answer is no,
- NOTE Confidence: 0.872389497272727
- $00{:}55{:}56{.}588 \dashrightarrow 00{:}55{:}58{.}490$ and and the reason is because
- NOTE Confidence: 0.872389497272727
- $00{:}55{:}58{.}556 \dashrightarrow 00{:}56{:}01{.}048$ in or certainly we could do it
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}01.048 \dashrightarrow 00{:}56{:}02.917$ 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

 $00{:}56{:}06.188 \dashrightarrow 00{:}56{:}08.414$ But as far as a receiver operating

NOTE Confidence: 0.872389497272727

 $00:56:08.414 \rightarrow 00:56:10.399$ curve you really want to do that.

NOTE Confidence: 0.872389497272727

 $00:56:10.400 \longrightarrow 00:56:12.500$ We could do that, you know,

NOTE Confidence: 0.872389497272727

 $00:56:12.500 \longrightarrow 00:56:13.150$ looking backwards,

NOTE Confidence: 0.872389497272727

 $00:56:13.150 \longrightarrow 00:56:15.750$ but the real way to do this would

NOTE Confidence: 0.872389497272727

 $00{:}56{:}15.813 \dashrightarrow 00{:}56{:}18.185$ 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

 $00:56:22.260 \longrightarrow 00:56:23.784$ follow them for three to five

NOTE Confidence: 0.872389497272727

 $00{:}56{:}23.784 \dashrightarrow 00{:}56{:}25.459$ years and and do testing,

NOTE Confidence: 0.872389497272727

 $00{:}56{:}25{.}460 \dashrightarrow 00{:}56{:}27{.}197$ and that's what the next stage is so we

NOTE Confidence: 0.872389497272727

 $00{:}56{:}27.197 \dashrightarrow 00{:}56{:}28.917$ can do that receiver operating curve.

NOTE Confidence: 0.872389497272727

 $00:56:28.920 \longrightarrow 00:56:30.100$ So we're not there yet,

NOTE Confidence: 0.872389497272727

 $00:56:30.100 \rightarrow 00:56:31.520$ but I think we're getting

- NOTE Confidence: 0.872389497272727
- $00:56:31.520 \longrightarrow 00:56:32.656$ closer to being there.
- NOTE Confidence: 0.872389497272727
- $00:56:32.660 \dashrightarrow 00:56:34.556$ 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
- $00:56:36.700 \rightarrow 00:56:38.644$ I get asked this question all the time.
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}38.650 \dashrightarrow 00{:}56{:}39.878$ Can you tell me?
- NOTE Confidence: 0.872389497272727
- $00:56:39.878 \rightarrow 00:56:41.106$ Does the reading disability
- NOTE Confidence: 0.872389497272727
- $00:56:41.106 \longrightarrow 00:56:42.957$ that we're seeing in this child?
- NOTE Confidence: 0.872389497272727
- $00:56:42.960 \rightarrow 00:56:44.984$ Is it more to do with orthographic coding?
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}44{.}990 \dashrightarrow 00{:}56{:}47{.}240$ Is more to do with phonological
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}47{.}240 \dashrightarrow 00{:}56{:}49{.}018$ awareness and and so then the
- NOTE Confidence: 0.872389497272727
- $00:56:49.018 \rightarrow 00:56:50.516$ intervention might be a little different
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}50{.}516 \dashrightarrow 00{:}56{:}52{.}322$ and I can tail or to the child.
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}52{.}330 \dashrightarrow 00{:}56{:}53{.}610$ We'd love to do that.
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}53{.}610 \dashrightarrow 00{:}56{:}55{.}794$ The thing to remember is that
- NOTE Confidence: 0.872389497272727
- $00{:}56{:}55{.}794 \dashrightarrow 00{:}56{:}57{.}790$ there is no orthographic coding,
- NOTE Confidence: 0.872389497272727

 $00:56:57.790 \longrightarrow 00:56:59.846$ and for the the for the non

NOTE Confidence: 0.872389497272727

 $00:56:59.846 \rightarrow 00:57:01.835$ informed of the group when we're

NOTE Confidence: 0.872389497272727

 $00{:}57{:}01{.}835 \dashrightarrow 00{:}57{:}03{.}600$ talking about is really spelling

NOTE Confidence: 0.872389497272727

 $00:57:03.600 \longrightarrow 00:57:05.209$ there is no spelling gene.

NOTE Confidence: 0.872389497272727

 $00:57:05.210 \longrightarrow 00:57:06.870$ There's no grammar gene,

NOTE Confidence: 0.872389497272727

 $00{:}57{:}06{.}870 \dashrightarrow 00{:}57{:}08{.}530$ 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

 $00{:}57{:}10.174 \dashrightarrow 00{:}57{:}12.640$ proteins make up the receptors and

NOTE Confidence: 0.872389497272727

 $00{:}57{:}12.708 \dashrightarrow 00{:}57{:}14.888$ the neurotransmitters or the brain.

NOTE Confidence: 0.872389497272727

 $00{:}57{:}14.890 \dashrightarrow 00{:}57{:}17.391$ 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

 $00{:}57{:}19{.}430 \dashrightarrow 00{:}57{:}21{.}080$ and so they worked together

NOTE Confidence: 0.872389497272727

 $00{:}57{:}21.080 \dashrightarrow 00{:}57{:}22.400$ in combination with different

NOTE Confidence: 0.872389497272727

 $00:57:22.400 \longrightarrow 00:57:23.898$ systems in order to enable us.

NOTE Confidence: 0.872389497272727

 $00{:}57{:}23{.}900 \dashrightarrow 00{:}57{:}26{.}994$ To do these very complex very human

NOTE Confidence: 0.872389497272727

 $00:57:26.994 \rightarrow 00:57:29.198$ things called decoding or reading

 $00{:}57{:}29{.}198 \dashrightarrow 00{:}57{:}31{.}598$ and spelling and music as well.

NOTE Confidence: 0.872389497272727

 $00:57:31.600 \rightarrow 00:57:33.220$ 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

 $00:57:34.700 \longrightarrow 00:57:36.180$ to be a single gene,

NOTE Confidence: 0.872389497272727

 $00:57:36.180 \longrightarrow 00:57:38.684$ 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

 $00:57:41.560 \longrightarrow 00:57:43.540$ 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

 $00{:}57{:}46.080 \dashrightarrow 00{:}57{:}47.724$ say, decoding versus spelling,

NOTE Confidence: 0.872389497272727

 $00:57:47.724 \longrightarrow 00:57:49.779$ but we don't know yet.

NOTE Confidence: 0.872389497272727

 $00:57:49.780 \dashrightarrow 00:57:51.250$ 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&
amp;
amp;
A and our time is up,

NOTE Confidence: 0.735784878

 $00{:}57{:}58.162 \dashrightarrow 00{:}58{:}00{.}310$ but I apologize to the many people.

00:58:00.310 --> 00:58:01.648 There's a lot of enthusiasm for NOTE Confidence: 0.73578487800:58:01.648 --> 00:58:03.106 this talk and many questions and NOTE Confidence: 0.73578487800:58:03.106 --> 00:58:04.648 comments which we didn't get to. NOTE Confidence: 0.73578487800:58:04.650 --> 00:58:06.380 So let me just congratulate NOTE Confidence: 0.73578487800:58:06.380 --> 00:58:08.690 you on a marvelous talk and I NOTE Confidence: 0.73578487800:58:06.380 --> 00:58:08.690 you on a marvelous talk and I NOTE Confidence: 0.73578487800:58:08.690 --> 00:58:10.430 think that takes up our hour NOTE Confidence: 0.735784878

 $00:58:10.430 \longrightarrow 00:58:12.280$ and thanks everybody for coming.