WEBVTT NOTE duration:"00:55:02.2080000" NOTE language:en-us NOTE Confidence: 0.8631226  $00:00:00.000 \rightarrow 00:00:02.560$  I'm so excited to share with you the NOTE Confidence: 0.8631226  $00:00:02.560 \rightarrow 00:00:05.675$  body of work I've been engaged in with NOTE Confidence: 0.8631226  $00:00:05.675 \rightarrow 00:00:08.658$  primates for really over the last 20 years, NOTE Confidence: 0.8631226  $00:00:08.660 \rightarrow 00:00:11.612$  so please bear with me for one moment while NOTE Confidence: 0.8631226  $00:00:11.612 \rightarrow 00:00:14.620$  I finalize my screen sharing and I just NOTE Confidence: 0.8631226  $00:00:14.620 \rightarrow 00:00:17.559$  need to click a few more buttons here. NOTE Confidence: 0.8631226  $00:00:17.560 \longrightarrow 00:00:20.052$  So please enjoy this lovely photo of NOTE Confidence: 0.8631226 00:00:20.052 --> 00:00:22.190 a monkey, Mother, infant and mom. NOTE Confidence: 0.80504614  $00:00:27.240 \longrightarrow 00:00:28.110$  OK. NOTE Confidence: 0.54492307  $00:00:42.620 \rightarrow 00:00:43.290$  Great. NOTE Confidence: 0.8785873 00:00:45.730 --> 00:00:48.354 So I'm so excited to talk today about NOTE Confidence: 0.8785873  $00:00:48.354 \rightarrow 00:00:50.034$  the intergenerational effects of secure NOTE Confidence: 0.8785873  $00:00:50.034 \rightarrow 00:00:52.288$  attachment in rhesus monkeys and what we NOTE Confidence: 0.8785873  $00:00:52.350 \rightarrow 00:00:54.516$  can learn from studying primate models.

- NOTE Confidence: 0.8785873
- $00:00:54.520 \longrightarrow 00:00:56.956$  But first, before I get into that

 $00:00:56.956 \rightarrow 00:00:59.587$  work and the work that led to it,

NOTE Confidence: 0.8785873

 $00:00:59.590 \rightarrow 00:01:02.174$  I think it's really important to put this

NOTE Confidence: 0.8785873

 $00:01:02.174 \rightarrow 00:01:05.325$  body of research into context and to do that,

NOTE Confidence: 0.8785873

00:01:05.330 --> 00:01:08.326 we're going to start at Green Park.

NOTE Confidence: 0.8785873

00:01:08.330 --> 00:01:10.178 Probably many of you are wondering

NOTE Confidence: 0.8785873

 $00:01:10.178 \longrightarrow 00:01:12.139$  what the heck is going park.

NOTE Confidence: 0.8785873

00:01:12.140 --> 00:01:14.756 Hogan Park was the name of the psychology

NOTE Confidence: 0.8785873

00:01:14.756 --> 00:01:16.900 Department at University of Wisconsin,

NOTE Confidence: 0.8785873

 $00{:}01{:}16{.}900 \dashrightarrow 00{:}01{:}18{.}735$  Madison and its street address

NOTE Confidence: 0.8785873

00:01:18.735 --> 00:01:20.920 was actually 600 N Park Ave.

NOTE Confidence: 0.8785873

00:01:20.920 --> 00:01:23.468 But when people would quickly scrawl the

NOTE Confidence: 0.8785873

00:01:23.468 --> 00:01:26.433 address back in the middle of the last

NOTE Confidence: 0.8785873

00:01:26.433 --> 00:01:28.542 century early last century, you know,

NOTE Confidence: 0.8785873

 $00{:}01{:}28{.}542 \dashrightarrow 00{:}01{:}30{.}528$  for intercampus Mail they would write

00:01:30.528 --> 00:01:32.997 600 and Park Anna sloppy handwriting.

NOTE Confidence: 0.8785873

 $00{:}01{:}33{.}000 \dashrightarrow 00{:}01{:}35{.}656$  It looks like Goon Park and the nickname

NOTE Confidence: 0.8785873

 $00{:}01{:}35{.}656 \dashrightarrow 00{:}01{:}38{.}386$  just stuck and so even though the building

NOTE Confidence: 0.8785873

00:01:38.386 --> 00:01:41.420 has long since been demolished and renovated,

NOTE Confidence: 0.8785873

 $00{:}01{:}41{.}420 \dashrightarrow 00{:}01{:}42.076$  the address.

NOTE Confidence: 0.8785873

 $00{:}01{:}42.076$  -->  $00{:}01{:}44.700$  Is still the same and good park is

NOTE Confidence: 0.8785873

 $00{:}01{:}44.776 \dashrightarrow 00{:}01{:}47.366$  important because it sets the stage for

NOTE Confidence: 0.8785873

 $00:01:47.366 \longrightarrow 00:01:50.507$  the work that will be talking about today.

NOTE Confidence: 0.8785873

00:01:50.510 --> 00:01:52.532 It's also the location for this

NOTE Confidence: 0.8785873

 $00{:}01{:}52{.}532 \dashrightarrow 00{:}01{:}54{.}702$  fabulous book which I recommend to

NOTE Confidence: 0.8785873

 $00:01:54.702 \dashrightarrow 00:01:57.327$  everybody here called Love at Goon Park.

NOTE Confidence: 0.8785873

00:01:57.330 --> 00:01:59.155 Written by Pulitzer Prize winning

NOTE Confidence: 0.8785873

 $00{:}01{:}59{.}155 \dashrightarrow 00{:}02{:}00{.}615$  journalist and science writer

NOTE Confidence: 0.8785873

00:02:00.615 --> 00:02:01.639 extraordinaire Deborah Blum,

NOTE Confidence: 0.8785873

 $00:02:01.640 \longrightarrow 00:02:04.862$  here's a little bit about that book for Eons,

NOTE Confidence: 0.8785873

 $00:02:04.870 \rightarrow 00:02:07.734$  Love was the province of poets and Dreamers.

- NOTE Confidence: 0.8785873
- 00:02:07.740 --> 00:02:09.172 Scientists considered it unworthy

 $00:02:09.172 \longrightarrow 00:02:10.246$  of real study,

NOTE Confidence: 0.8785873

00:02:10.250 - 00:02:13.114 yet in the middle of the last century,

NOTE Confidence: 0.8785873

 $00:02:13.120 \longrightarrow 00:02:14.990$  one scientist had the courage.

NOTE Confidence: 0.8785873

 $00:02:14.990 \longrightarrow 00:02:16.745$  And the curiosity to uncover

NOTE Confidence: 0.8785873

 $00{:}02{:}16.745 \dashrightarrow 00{:}02{:}18.500$  the true power of love.

NOTE Confidence: 0.8785873

 $00:02:18.500 \longrightarrow 00:02:20.586$  And he forever changed the way we

NOTE Confidence: 0.8785873

 $00:02:20.586 \dashrightarrow 00:02:22.360$  think about human relationships.

NOTE Confidence: 0.8785873

 $00:02:22.360 \longrightarrow 00:02:24.466$  This is the story of that

NOTE Confidence: 0.8785873

 $00:02:24.466 \longrightarrow 00:02:25.168$  great transformation.

NOTE Confidence: 0.8785873

00:02:25.170 --> 00:02:26.313 And in fact,

NOTE Confidence: 0.8785873

 $00{:}02{:}26{.}313 \dashrightarrow 00{:}02{:}28{.}218$  that one human whom she

NOTE Confidence: 0.8785873

 $00:02:28.218 \dashrightarrow 00:02:30.378$  writes about was Harry Harlow.

NOTE Confidence: 0.8785873

00:02:30.380 --> 00:02:33.124 Now, although he died almost 40 years ago,

NOTE Confidence: 0.8785873

00:02:33.130 --> 00:02:34.850 Harry Harlow had a lasting

- $00:02:34.850 \longrightarrow 00:02:36.226$  impact on the science.
- NOTE Confidence: 0.8785873
- $00{:}02{:}36{.}230 \dashrightarrow 00{:}02{:}38{.}974$  We do the treatments we give to children,
- NOTE Confidence: 0.8785873
- $00:02:38.980 \longrightarrow 00:02:40.177$  and most importantly,
- NOTE Confidence: 0.8785873
- 00:02:40.177 --> 00:02:42.571 what we know to be true
- NOTE Confidence: 0.8785873
- $00{:}02{:}42.571 \dashrightarrow 00{:}02{:}44.380$  about children's needs.
- NOTE Confidence: 0.8785873
- $00{:}02{:}44{.}380 \dashrightarrow 00{:}02{:}47{.}548$  Now Harlow is best known for his now
- NOTE Confidence: 0.8785873
- 00:02:47.548 --> 00:02:49.978 controversial studies on maternal separation,
- NOTE Confidence: 0.8785873
- 00:02:49.980 --> 00:02:51.604 like social isolation Ring,
- NOTE Confidence: 0.8785873
- $00{:}02{:}51{.}604 \dashrightarrow 00{:}02{:}54{.}040$  which is depicted here in which
- NOTE Confidence: 0.8785873
- $00:02:54.109 \longrightarrow 00:02:56.364$  infant monkeys would be reared
- NOTE Confidence: 0.8785873
- $00:02:56.364 \rightarrow 00:02:58.168$  in complete total isolation.
- NOTE Confidence: 0.8785873
- 00:02:58.170 --> 00:02:59.520 No visual, auditory,
- NOTE Confidence: 0.8785873
- $00:02:59.520 \rightarrow 00:03:02.670$  or tactile access to any other animals
- NOTE Confidence: 0.8785873
- $00{:}03{:}02{.}751 \dashrightarrow 00{:}03{:}05{.}495$  for periods ranging up to 12 months.
- NOTE Confidence: 0.8785873
- $00:03:05.500 \rightarrow 00:03:07.224$  These studies actually followed
- NOTE Confidence: 0.8785873
- 00:03:07.224 --> 00:03:08.948 his very earliest studies,

- NOTE Confidence: 0.8785873
- $00:03:08.950 \dashrightarrow 00:03:11.946$  which he's also known for into attachment

 $00{:}03{:}11{.}946 \dashrightarrow 00{:}03{:}14{.}640$  by studying monkeys on attachments too.

NOTE Confidence: 0.8785873

00:03:14.640 --> 00:03:16.053 Inanimate surrogate mothers

NOTE Confidence: 0.8785873

 $00:03:16.053 \rightarrow 00:03:18.879$  covered in a soft fuzzy cloth.

NOTE Confidence: 0.8785873

00:03:18.880 --> 00:03:19.232 Ann,

NOTE Confidence: 0.8785873

 $00{:}03{:}19{.}232 \dashrightarrow 00{:}03{:}21{.}696$  it's important to know that these studies

NOTE Confidence: 0.8785873

 $00:03:21.696 \dashrightarrow 00:03:24.326$  were not so controversial at the time.

NOTE Confidence: 0.8785873

 $00:03:24.330 \longrightarrow 00:03:26.140$  In the 1950s and 60s,

NOTE Confidence: 0.8785873

 $00:03:26.140 \longrightarrow 00:03:28.303$  because but they are now and the

NOTE Confidence: 0.8785873

 $00:03:28.303 \dashrightarrow 00:03:31.262$  reason for that is that we need to

NOTE Confidence: 0.8785873

 $00:03:31.262 \rightarrow 00:03:32.834$  recognize that scientific standards

NOTE Confidence: 0.8785873

00:03:32.834 --> 00:03:35.158 change overtime as we gain knowledge

NOTE Confidence: 0.8785873

 $00{:}03{:}35{.}158$  -->  $00{:}03{:}37{.}393$  an this includes the ethical standards.

NOTE Confidence: 0.8785873

 $00{:}03{:}37{.}393 \dashrightarrow 00{:}03{:}40{.}297$  Now, for a look into how ethical standards,

NOTE Confidence: 0.8785873

 $00:03:40.300 \dashrightarrow 00:03:42.110$  and also oversight, has changed.

00:03:42.110 --> 00:03:45.740 I mean, just take a look at that PPE right?

NOTE Confidence: 0.8785873

 $00{:}03{:}45{.}740 \dashrightarrow 00{:}03{:}47{.}232$  He's not wearing any,

NOTE Confidence: 0.8785873

 $00{:}03{:}47{.}232 \dashrightarrow 00{:}03{:}49{.}470$  and there's no way it that.

NOTE Confidence: 0.8785873

 $00{:}03{:}49{.}470 \dashrightarrow 00{:}03{:}51{.}384$  Anybody now could walk up to

NOTE Confidence: 0.8785873

 $00:03:51.384 \longrightarrow 00:03:52.660$  any monkey in it

NOTE Confidence: 0.86226094

 $00:03:52.736 \longrightarrow 00:03:54.440$  in their street clothes?

NOTE Confidence: 0.86226094

00:03:54.440 --> 00:03:56.925 So not only has PPE standards change,

NOTE Confidence: 0.86226094

 $00{:}03{:}56{.}930 \dashrightarrow 00{:}03{:}59{.}506$  but the way we treat the animals that

NOTE Confidence: 0.86226094

 $00:03:59.506 \rightarrow 00:04:02.155$  we work with and the types of research NOTE Confidence: 0.86226094

 $00{:}04{:}02{.}155 \dashrightarrow 00{:}04{:}05{.}090$  that we can do have evolved overtime.

NOTE Confidence: 0.86226094

 $00{:}04{:}05{.}090 \dashrightarrow 00{:}04{:}07{.}470$  And in fact there is very strict

NOTE Confidence: 0.86226094

 $00:04:07.470 \longrightarrow 00:04:09.000$  oversight at multiple levels.

NOTE Confidence: 0.86226094

 $00:04:09.000 \rightarrow 00:04:10.392$  Anybody conducting monkey research

NOTE Confidence: 0.86226094

 $00:04:10.392 \longrightarrow 00:04:12.963$  has to adhere by law by federal

NOTE Confidence: 0.86226094

 $00{:}04{:}12{.}963 \dashrightarrow 00{:}04{:}15{.}038$  law to institutional oversight and

NOTE Confidence: 0.86226094

 $00:04:15.038 \rightarrow 00:04:17.360$  multiple levels of federal oversight.

- NOTE Confidence: 0.86226094
- 00:04:17.360 --> 00:04:19.760 And so, along with the change

00:04:19.760 --> 00:04:20.960 in ethical standards,

NOTE Confidence: 0.86226094

 $00:04:20.960 \longrightarrow 00:04:23.360$  the science has changed as well.

NOTE Confidence: 0.86226094

 $00:04:23.360 \rightarrow 00:04:25.508$  Now most people don't know that

NOTE Confidence: 0.86226094

 $00{:}04{:}25{.}508 \dashrightarrow 00{:}04{:}27{.}479$  for several decades before his

NOTE Confidence: 0.86226094

00:04:27.479 --> 00:04:29.359 experimental work into attachment,

NOTE Confidence: 0.86226094

00:04:29.360 --> 00:04:31.360 Harlow actually studied learning cognition.

NOTE Confidence: 0.86226094

 $00:04:31.360 \longrightarrow 00:04:33.760$  An even neural function in monkeys.

NOTE Confidence: 0.86226094

 $00{:}04{:}33.760 \dashrightarrow 00{:}04{:}37.064$  So for the first few decades of his

NOTE Confidence: 0.86226094

00:04:37.064 --> 00:04:39.756 careeer working first at a nearby zoo,

NOTE Confidence: 0.86226094

 $00:04:39.760 \longrightarrow 00:04:42.160$  but then developing his own lab,

NOTE Confidence: 0.86226094

 $00{:}04{:}42.160 \dashrightarrow 00{:}04{:}44.560$  he studied cognitive abilities in primates,

NOTE Confidence: 0.86226094

00:04:44.560 --> 00:04:47.500 and he discovered that monkeys were far NOTE Confidence: 0.86226094

 $00:04:47.500 \rightarrow 00:04:49.818$  more cognitively complex than rats were.

NOTE Confidence: 0.86226094

00:04:49.820 --> 00:04:50.106 Again,

 $00{:}04{:}50{.}106 \dashrightarrow 00{:}04{:}52{.}394$  we didn't know that at the time and

NOTE Confidence: 0.86226094

 $00:04:52.394 \rightarrow 00:04:54.541$  they could form complex learning

NOTE Confidence: 0.86226094

 $00:04:54.541 \rightarrow 00:04:56.337$  and problem solving strategies.

NOTE Confidence: 0.86226094

 $00:04:56.340 \longrightarrow 00:04:56.940$  That is,

NOTE Confidence: 0.86226094

 $00{:}04{:}56{.}940 \dashrightarrow 00{:}04{:}59{.}040$  they could learn to learn and the

NOTE Confidence: 0.86226094

 $00{:}04{:}59{.}040 \dashrightarrow 00{:}05{:}00{.}919$  way he devised this information

NOTE Confidence: 0.86226094

 $00{:}05{:}00{.}919 \dashrightarrow 00{:}05{:}03{.}187$  is by developing a Now classic

NOTE Confidence: 0.86226094

 $00{:}05{:}03.258 \dashrightarrow 00{:}05{:}05.018$  apparatus at least classic,

NOTE Confidence: 0.86226094

 $00{:}05{:}05{.}020 \dashrightarrow 00{:}05{:}06{.}628$  to cognitive psychologists and

NOTE Confidence: 0.86226094

 $00{:}05{:}06.628 \dashrightarrow 00{:}05{:}07.834$  comparative psychologists called

NOTE Confidence: 0.86226094

00:05:07.834 --> 00:05:09.392 the Wisconsin General Testing

NOTE Confidence: 0.86226094

 $00:05:09.392 \dashrightarrow 00:05:11.174$  apparatus depicted here on the left,

NOTE Confidence: 0.86226094

 $00:05:11.180 \longrightarrow 00:05:12.224$  or the WDT,

NOTE Confidence: 0.86226094

 $00{:}05{:}12.224 \dashrightarrow 00{:}05{:}14.312$  and this is important because it's

NOTE Confidence: 0.86226094

 $00:05:14.312 \longrightarrow 00:05:16.608$  going to make an appearance later,

NOTE Confidence: 0.86226094

 $00:05:16.610 \rightarrow 00:05:18.415$  so Harlow and discovering how

- NOTE Confidence: 0.86226094
- 00:05:18.415 --> 00:05:19.498 smart monkeys were.

 $00{:}05{:}19{.}500 \dashrightarrow 00{:}05{:}22{.}524$  He wanted to study the ontogeny of learning.

NOTE Confidence: 0.86226094

 $00{:}05{:}22{.}530 \dashrightarrow 00{:}05{:}23{.}486$  So to do this,

NOTE Confidence: 0.86226094

 $00:05:23.486 \rightarrow 00:05:25.390$  he needed easy access to infant monkeys,

NOTE Confidence: 0.86226094

 $00{:}05{:}25{.}390 \dashrightarrow 00{:}05{:}27{.}800$  so he started a nursery.

NOTE Confidence: 0.86226094

 $00{:}05{:}27{.}800 \dashrightarrow 00{:}05{:}29{.}921$  And he observed that during the routine

NOTE Confidence: 0.86226094

 $00:05:29.921 \dashrightarrow 00:05:31.848$  care and cleaning up these nursery

NOTE Confidence: 0.86226094

 $00:05:31.848 \rightarrow 00:05:33.762$  monkeys where they had cloth diapers

NOTE Confidence: 0.86226094

 $00:05:33.762 \dashrightarrow 00:05:35.576$  lining the bottoms of their cages.

NOTE Confidence: 0.86226094

 $00:05:35.580 \rightarrow 00:05:37.130$  Whenever the diapers were removed,

NOTE Confidence: 0.86226094

 $00{:}05{:}37{.}130 \dashrightarrow 00{:}05{:}38{.}835$  the infants would throw major

NOTE Confidence: 0.86226094

00:05:38.835 --> 00:05:40.873 tantrums and would only be sued

NOTE Confidence: 0.86226094

00:05:40.873 - > 00:05:43.033 when a new cloth diaper was put in.

NOTE Confidence: 0.86226094

 $00{:}05{:}43.040 \dashrightarrow 00{:}05{:}44.196$  And so he thought.

NOTE Confidence: 0.86226094

 $00:05:44.196 \dashrightarrow 00:05:45.641$  Could these monkeys be attached

 $00:05:45.641 \longrightarrow 00:05:47.080$  to their cloth diapers?

NOTE Confidence: 0.86226094

 $00{:}05{:}47{.}080 \dashrightarrow 00{:}05{:}49{.}768$  And this in fact led to his series

NOTE Confidence: 0.86226094

 $00{:}05{:}49.768 \dashrightarrow 00{:}05{:}51.919$  of studies in the next several

NOTE Confidence: 0.86226094

 $00{:}05{:}51{.}919 \dashrightarrow 00{:}05{:}54{.}025$  decades for the rest of his

NOTE Confidence: 0.86226094

 $00{:}05{:}54{.}100 \dashrightarrow 00{:}05{:}56{.}488$  career into affectional systems.

NOTE Confidence: 0.86226094

 $00{:}05{:}56{.}490 \dashrightarrow 00{:}05{:}58{.}035$  Now it's impossible to overstate

NOTE Confidence: 0.86226094

 $00{:}05{:}58.035 \dashrightarrow 00{:}06{:}00.221$  just how much we now take for

NOTE Confidence: 0.86226094

 $00:06:00.221 \longrightarrow 00:06:01.969$  granted that it is normal, natural,

NOTE Confidence: 0.86226094

 $00{:}06{:}01{.}969 \dashrightarrow 00{:}06{:}03{.}992$  and necessary to touch and hug and

NOTE Confidence: 0.86226094

 $00{:}06{:}03.992 \dashrightarrow 00{:}06{:}06{.}249$  hold our children and to nurture them,

NOTE Confidence: 0.86226094

 $00:06:06.250 \longrightarrow 00:06:08.690$  and not just for moms to do it,

NOTE Confidence: 0.86226094

 $00:06:08.690 \rightarrow 00:06:10.825$  but for dads to do it too,

NOTE Confidence: 0.86226094

00:06:10.830 --> 00:06:13.270 and not just to do this in infancy,

NOTE Confidence: 0.86226094

 $00:06:13.270 \longrightarrow 00:06:14.790$  but across their whole lives,

NOTE Confidence: 0.86226094

 $00:06:14.790 \longrightarrow 00:06:16.925$  and not just to do it when

NOTE Confidence: 0.86226094

 $00:06:16.925 \rightarrow 00:06:17.840$  they're behaving well,

- NOTE Confidence: 0.86226094
- $00:06:17.840 \longrightarrow 00:06:19.120$  but maybe most importantly,

 $00{:}06{:}19{.}120 \dashrightarrow 00{:}06{:}21{.}638$  when they are upset and need need that

NOTE Confidence: 0.86226094

00:06:21.638 --> 00:06:23.782 comfort most like you can see in this

NOTE Confidence: 0.86226094

 $00:06:23.848 \rightarrow 00:06:26.074$  final picture here in the bottom right,

NOTE Confidence: 0.86226094

 $00:06:26.080 \rightarrow 00:06:28.348$  where my husband is comforting her son.

NOTE Confidence: 0.86226094

00:06:28.350 --> 00:06:28.593 Sorry,

NOTE Confidence: 0.86226094

 $00:06:28.593 \rightarrow 00:06:30.537$  the day we had to Bury our cat.

NOTE Confidence: 0.86226094

 $00:06:30.540 \longrightarrow 00:06:33.690$  It was emotional for all of us.

NOTE Confidence: 0.86226094

00:06:33.690 --> 00:06:35.538 So we take this for granted now,

NOTE Confidence: 0.86226094

 $00{:}06{:}35{.}540 \dashrightarrow 00{:}06{:}37{.}466$  and it's because of Harlow's work

NOTE Confidence: 0.86226094

 $00{:}06{:}37.466 \dashrightarrow 00{:}06{:}40.258$  that we now can take this for granted.

NOTE Confidence: 0.86226094

 $00{:}06{:}40{.}260 \dashrightarrow 00{:}06{:}42{.}213$  And his work has also laid the

NOTE Confidence: 0.86226094

 $00{:}06{:}42.213 \dashrightarrow 00{:}06{:}44.188$  foundation for the treatments we give.

NOTE Confidence: 0.86226094

 $00:06:44.190 \longrightarrow 00:06:44.694$  For example,

NOTE Confidence: 0.86226094

 $00:06:44.694 \longrightarrow 00:06:46.710$  to infants in the Nick you for the

00:06:46.768 --> 00:06:48.109 breast feeding practices,

NOTE Confidence: 0.85176957

 $00{:}06{:}48.110 \dashrightarrow 00{:}06{:}50.140$  and also again for the ways that

NOTE Confidence: 0.85176957

 $00{:}06{:}50{.}140 \dashrightarrow 00{:}06{:}52{.}468$  we care for children across their

NOTE Confidence: 0.85176957

 $00:06:52.468 \dashrightarrow 00:06:54.778$  life spans and across generations.

NOTE Confidence: 0.85176957

 $00{:}06{:}54.780 \dashrightarrow 00{:}06{:}57.460$  As I said, this was not always the

NOTE Confidence: 0.85176957

 $00{:}06{:}57{.}460 \dashrightarrow 00{:}06{:}59{.}740$  document in the mid 20th century.

NOTE Confidence: 0.85176957

 $00{:}06{:}59{.}740 \dashrightarrow 00{:}07{:}02{.}281$  Common dogma was that too much physical

NOTE Confidence: 0.85176957

 $00:07:02.281 \rightarrow 00:07:04.690$  contact with children would make them weak,

NOTE Confidence: 0.85176957

00:07:04.690 --> 00:07:06.102 both physically via exposure

NOTE Confidence: 0.85176957

 $00:07:06.102 \dashrightarrow 00:07:07.514$  to germs and psychologically.

NOTE Confidence: 0.85176957

 $00:07:07.520 \longrightarrow 00:07:09.571$  And you can see this quote from

NOTE Confidence: 0.85176957

 $00{:}07{:}09{.}571 \dashrightarrow 00{:}07{:}12{.}128$  one of the fathers of behaviorism.

NOTE Confidence: 0.85176957

00:07:12.130 --> 00:07:14.594 In his book on Infant Child Care,

NOTE Confidence: 0.85176957

 $00:07:14.600 \longrightarrow 00:07:16.676$  you will soon be ashamed of

NOTE Confidence: 0.85176957

00:07:16.676 --> 00:07:18.485 the mawkish sentimental way you

NOTE Confidence: 0.85176957

00:07:18.485 - 00:07:20.270 have been handling your child.

 $00{:}07{:}20.270 \dashrightarrow 00{:}07{:}22.628$  Well, Harlow disagreed and based on

NOTE Confidence: 0.85176957

 $00:07:22.628 \rightarrow 00:07:25.639$  what he observed in his infant monkeys.

NOTE Confidence: 0.85176957

 $00{:}07{:}25.640 \dashrightarrow 00{:}07{:}27.224$  He stated in his first presentation

NOTE Confidence: 0.85176957

 $00{:}07{:}27{.}224 \dashrightarrow 00{:}07{:}29{.}271$  of these findings to the American

NOTE Confidence: 0.85176957

 $00:07:29.271 \dashrightarrow 00:07:30.213$  Psychological Association

NOTE Confidence: 0.85176957

 $00:07:30.213 \longrightarrow 00:07:31.155$  presidential address.

NOTE Confidence: 0.85176957

 $00:07:31.160 \rightarrow 00:07:33.920$  He boldly stated there is more to mother.

NOTE Confidence: 0.85176957

 $00:07:33.920 \longrightarrow 00:07:36.680$  There is more to Mother love than milk,

NOTE Confidence: 0.85176957

 $00:07:36.680 \longrightarrow 00:07:37.715$  and that's perfectly

NOTE Confidence: 0.85176957

 $00:07:37.715 \longrightarrow 00:07:39.440$  illustrated by this image here,

NOTE Confidence: 0.85176957

 $00:07:39.440 \longrightarrow 00:07:41.813$  in which the infant monkey is maintaining

NOTE Confidence: 0.85176957

 $00{:}07{:}41.813 \dashrightarrow 00{:}07{:}43.907$  as much physical contact as possible

NOTE Confidence: 0.85176957

 $00{:}07{:}43{.}907 \dashrightarrow 00{:}07{:}45{.}941$  with a soft cloth surrogate mother

NOTE Confidence: 0.85176957

 $00{:}07{:}45{.}941 \dashrightarrow 00{:}07{:}48{.}410$  and stretching over to drink from the

NOTE Confidence: 0.85176957

 $00:07:48.410 \dashrightarrow 00:07:50.825$  bottle that's attached to the wire mother.

- $00:07:50.825 \longrightarrow 00:07:51.860$  And in fact,
- NOTE Confidence: 0.85176957
- $00:07:51.860 \dashrightarrow 00:07:53.700$  he also discovered that monkeys
- NOTE Confidence: 0.85176957
- $00{:}07{:}53.700 \dashrightarrow 00{:}07{:}55.919$  would learn to open windows just
- NOTE Confidence: 0.85176957
- $00{:}07{:}55{.}919 \dashrightarrow 00{:}07{:}57{.}479$  to get glimpses of their.
- NOTE Confidence: 0.85176957
- $00{:}07{:}57{.}480 \dashrightarrow 00{:}07{:}58{.}530$  Soft cloth covers.
- NOTE Confidence: 0.85176957
- $00:07:58.530 \longrightarrow 00:07:59.230$  Surrogate mother.
- NOTE Confidence: 0.8651896
- $00{:}08{:}01{.}430 \dashrightarrow 00{:}08{:}03{.}395$  And so his studies really
- NOTE Confidence: 0.8651896
- $00:08:03.395 \longrightarrow 00:08:04.967$  revolutionized the scientific thinking
- NOTE Confidence: 0.8651896
- $00{:}08{:}04{.}967 \dashrightarrow 00{:}08{:}06{.}769$  about socialization processes.
- NOTE Confidence: 0.8651896
- 00:08:06.770 --> 00:08:09.000 Now around the same time,
- NOTE Confidence: 0.8651896
- $00:08:09.000 \rightarrow 00:08:11.670$  someone else was getting into attachment,
- NOTE Confidence: 0.8651896
- $00:08:11.670 \rightarrow 00:08:14.058$  and we're probably all very familiar
- NOTE Confidence: 0.8651896
- $00{:}08{:}14.058 \dashrightarrow 00{:}08{:}17.010$  with this father of attachment theory.
- NOTE Confidence: 0.8651896
- 00:08:17.010 --> 00:08:18.566 British psychologist John Bowlby.
- NOTE Confidence: 0.8651896
- $00:08:18.566 \rightarrow 00:08:21.690$  I really hope that anyone here who works
- NOTE Confidence: 0.8651896
- $00:08:21.690 \rightarrow 00:08:23.874$  with children is familiar with John

- NOTE Confidence: 0.8651896
- $00:08:23.874 \rightarrow 00:08:26.069$  Bowlby's early theories of attachment,
- NOTE Confidence: 0.8651896
- $00:08:26.070 \longrightarrow 00:08:27.800$  which also changed the way
- NOTE Confidence: 0.8651896
- $00:08:27.800 \longrightarrow 00:08:29.184$  we think about children.
- NOTE Confidence: 0.8651896
- 00:08:29.190 --> 00:08:30.900 However, Bowlby knew of no
- NOTE Confidence: 0.8651896
- $00:08:30.900 \dashrightarrow 00:08:32.268$  experiments that manipulated the
- NOTE Confidence: 0.8651896
- $00:08:32.268 \rightarrow 00:08:33.699$  potentially relevant variables in
- NOTE Confidence: 0.8651896
- $00:08:33.699 \rightarrow 00:08:35.419$  the domain of attachment formation,
- NOTE Confidence: 0.8651896
- $00:08:35.420 \longrightarrow 00:08:39.164$  and that is to say he knew of no
- NOTE Confidence: 0.8651896
- $00{:}08{:}39{.}164 \dashrightarrow 00{:}08{:}42{.}190$  science to support his theories.
- NOTE Confidence: 0.8651896
- 00:08:42.190 --> 00:08:43.369 Well, Fortunately enough,
- NOTE Confidence: 0.8651896
- $00:08:43.369 \rightarrow 00:08:45.334$  and this is something interesting
- NOTE Confidence: 0.8651896
- 00:08:45.334 --> 00:08:47.210 I discovered in the research
- NOTE Confidence: 0.8651896
- $00{:}08{:}47{.}210 \dashrightarrow 00{:}08{:}48{.}245$  for this presentation.
- NOTE Confidence: 0.8651896
- $00{:}08{:}48.250 \dashrightarrow 00{:}08{:}50.218$  Turns out boldly in Harlem became
- NOTE Confidence: 0.8651896
- $00{:}08{:}50{.}218 \dashrightarrow 00{:}08{:}52{.}406$  friends and I really want to
- NOTE Confidence: 0.8651896

 $00:08:52.406 \rightarrow 00:08:54.441$  encourage everyone point you to

NOTE Confidence: 0.8651896

 $00:08:54.441 \dashrightarrow 00:08:56.210$  this fascinating historical article.

NOTE Confidence: 0.8651896

00:08:56.210 --> 00:08:58.514 I love you Tana that talks about and

NOTE Confidence: 0.8651896

 $00{:}08{:}58{.}514 \dashrightarrow 00{:}09{:}01{.}042$  really goes into detail about their

NOTE Confidence: 0.8651896

 $00{:}09{:}01{.}042 \dashrightarrow 00{:}09{:}02{.}461$  professional correspondence that

NOTE Confidence: 0.8651896

 $00{:}09{:}02{.}461 \dashrightarrow 00{:}09{:}05{.}310$  evolved giver, hug and kiss for me.

NOTE Confidence: 0.8651896

 $00:09:05.310 \longrightarrow 00:09:05.681$  OK,

NOTE Confidence: 0.8651896

 $00{:}09{:}05{.}681 \dashrightarrow 00{:}09{:}07{.}536$  dad and collaboration give her

NOTE Confidence: 0.8651896

 $00{:}09{:}07{.}536 \dashrightarrow 00{:}09{:}09{.}480$  a hug and kiss from.

NOTE Confidence: 0.7825027

 $00{:}09{:}15{.}490 \dashrightarrow 00{:}09{:}17{.}140$ Amanda, can you unmute yourself? Sorry.

NOTE Confidence: 0.86047333

 $00{:}09{:}22{.}970 \dashrightarrow 00{:}09{:}24{.}245$  OK, that's better.

NOTE Confidence: 0.86047333

 $00:09:24.245 \dashrightarrow 00:09:26.795$  OK, so their correspondent started in

NOTE Confidence: 0.86047333

 $00{:}09{:}26.795 \dashrightarrow 00{:}09{:}29.852$ 1957 and in one of the first response is

NOTE Confidence: 0.86047333

00:09:29.852 --> 00:09:32.448 that Harry Harlow gave to John Bowlby,

NOTE Confidence: 0.86047333

 $00:09:32.450 \longrightarrow 00:09:35.102$  which is almost exactly 63 years

NOTE Confidence: 0.86047333

 $00:09:35.102 \rightarrow 00:09:37.734$  ago to the day. Harlow rotable be.

- NOTE Confidence: 0.86047333
- $00:09:37.734 \longrightarrow 00:09:38.598$  It's an understatement.

 $00:09:38.600 \dashrightarrow 00:09:40.511$  To add that we have research interests

NOTE Confidence: 0.86047333

 $00:09:40.511 \rightarrow 00:09:42.648$  in common and from this point forward,

NOTE Confidence: 0.86047333

 $00:09:42.650 \rightarrow 00:09:44.666$  the two greatly influenced each other's work.

NOTE Confidence: 0.86047333

00:09:44.670 --> 00:09:46.120 Bowlby sent Harlow, for example,

NOTE Confidence: 0.86047333

 $00{:}09{:}46.120 \dashrightarrow 00{:}09{:}48.232$  a draft paper for which he would be

NOTE Confidence: 0.86047333

 $00:09:48.232 \longrightarrow 00:09:50.049$  most grateful for any comments and

NOTE Confidence: 0.86047333

 $00:09:50.049 \dashrightarrow 00:09:51.891$  criticisms that Harlow care to make.

NOTE Confidence: 0.86047333

00:09:51.900 - 00:09:53.916 What was the name of that paper?

NOTE Confidence: 0.86047333

 $00:09:53.920 \longrightarrow 00:09:56.080$  Well, it was his first draft of the

NOTE Confidence: 0.86047333

 $00:09:56.080 \rightarrow 00:09:58.546$  nature of the child's tide to its mother,

NOTE Confidence: 0.86047333

 $00:09:58.550 \longrightarrow 00:10:00.120$  which he published in 19.

NOTE Confidence: 0.86047333

 $00:10:00.120 \longrightarrow 00:10:01.989$  58 and Harlow would refer to this

NOTE Confidence: 0.86047333

 $00{:}10{:}01{.}989 \dashrightarrow 00{:}10{:}03{.}780$  paper as the reference Bible.

NOTE Confidence: 0.8378843

 $00:10:07.470 \longrightarrow 00:10:09.440$  And so, over the years,

 $00:10:09.440 \longrightarrow 00:10:11.786$  hard over the next several years,

NOTE Confidence: 0.8378843

00:10:11.790 --> 00:10:14.358 Harlows work his empirical findings on

NOTE Confidence: 0.8378843

 $00{:}10{:}14.358 \dashrightarrow 00{:}10{:}16.494$  maternal separation provided Bowlby with NOTE Confidence: 0.8378843

 $00{:}10{:}16{.}494 \dashrightarrow 00{:}10{:}19{.}406$  evidence that he needed for his own knew NOTE Confidence: 0.8378843

00:10:19.406 --> 00:10:20.950 conceptualisation of separation anxiety

NOTE Confidence: 0.8378843

 $00{:}10{:}20{.}950 \dashrightarrow 00{:}10{:}23{.}182$  as a survival mechanism for infants,

NOTE Confidence: 0.8378843

 $00{:}10{:}23.190 \dashrightarrow 00{:}10{:}25.674$  and particularly of the mother or

NOTE Confidence: 0.8378843

 $00:10:25.674 \rightarrow 00:10:28.492$  caregiver as a haven of safety with

NOTE Confidence: 0.8378843

 $00{:}10{:}28.492 \dashrightarrow 00{:}10{:}31.012$  a term which Harlow would use in

NOTE Confidence: 0.8378843

 $00:10:31.097 \rightarrow 00:10:32.877$  subsequent publications or what

NOTE Confidence: 0.8378843

 $00{:}10{:}32.877 \dashrightarrow 00{:}10{:}35.547$  we now call a secure base.

NOTE Confidence: 0.8378843

 $00:10:35.550 \rightarrow 00:10:38.160$  And so if it's true that John Bowlby is

NOTE Confidence: 0.8378843

 $00:10:38.160 \longrightarrow 00:10:40.367$  considered the father of attachment theory,

NOTE Confidence: 0.8378843

00:10:40.370 --> 00:10:43.826 then I think it's only fair to consider Harry

NOTE Confidence: 0.8378843

 $00{:}10{:}43.826 \dashrightarrow 00{:}10{:}46.718$  Harlow the father of attachment science.

NOTE Confidence: 0.8378843

 $00{:}10{:}46.720 \dashrightarrow 00{:}10{:}48.271$  And Harlow intern.

 $00:10:48.271 \rightarrow 00:10:50.339$  This relationship was bidirectional

NOTE Confidence: 0.8378843

00:10:50.339 --> 00:10:52.330 Harlow Internews Bowlby's theories

NOTE Confidence: 0.8378843

 $00{:}10{:}52{.}330 \dashrightarrow 00{:}10{:}54{.}574$  and his inspiration for the design

NOTE Confidence: 0.8378843

 $00:10:54.574 \rightarrow 00:10:56.635$  of his studies to systematically

NOTE Confidence: 0.8378843

 $00{:}10{:}56.635 \dashrightarrow 00{:}10{:}59.233$  test the effects of maternal infant

NOTE Confidence: 0.8378843

 $00:10:59.233 \rightarrow 00:11:01.038$  separation on infant development.

NOTE Confidence: 0.8378843

 $00{:}11{:}01{.}038 \dashrightarrow 00{:}11{:}03.852$  And it's really important to note

NOTE Confidence: 0.8378843

 $00:11:03.852 \rightarrow 00:11:05.680$  Bowlby's influence on comparative

NOTE Confidence: 0.8378843

 $00{:}11{:}05{.}680 \dashrightarrow 00{:}11{:}08{.}564$  psychology and animal research as a field,

NOTE Confidence: 0.8378843

 $00{:}11{:}08{.}570$  -->  $00{:}11{:}12{.}080$  and these are just some of the three major NOTE Confidence: 0.8378843

 $00:11:12.080 \rightarrow 00:11:15.705$  ways that his thinking influenced our work.

NOTE Confidence: 0.8061445

00:11:20.410 --> 00:11:22.804 So Harlow then from that point on

NOTE Confidence: 0.8061445

 $00{:}11{:}22.804 \dashrightarrow 00{:}11{:}25.454$  made a career of using rhesus monkeys

NOTE Confidence: 0.8061445

 $00{:}11{:}25{.}454 \dashrightarrow 00{:}11{:}28{.}415$  to study things that were not easily

NOTE Confidence: 0.8061445

 $00{:}11{:}28{.}415 \dashrightarrow 00{:}11{:}30{.}687$  researched in humans themselves.

00:11:30.690 --> 00:11:32.928 He studied the consequences of blocking

NOTE Confidence: 0.8061445

 $00{:}11{:}32{.}928 \dashrightarrow 00{:}11{:}34{.}950$  the formation of different affectional

NOTE Confidence: 0.8061445

00:11:34.950 --> 00:11:36.846 systems via isolation rearing,

NOTE Confidence: 0.8061445

 $00:11:36.850 \longrightarrow 00:11:38.494$  which I also mentioned,

NOTE Confidence: 0.8061445

 $00:11:38.494 \longrightarrow 00:11:40.549$  or which I mentioned earlier,

NOTE Confidence: 0.8061445

00:11:40.550 --> 00:11:41.783 affectively reproducing psychopathologies

NOTE Confidence: 0.8061445

 $00:11:41.783 \rightarrow 00:11:44.660$  in monkeys that are observable in humans,

NOTE Confidence: 0.8061445

 $00:11:44.660 \rightarrow 00:11:45.956$  namely severe depression,

NOTE Confidence: 0.8061445

 $00{:}11{:}45{.}956 \dashrightarrow 00{:}11{:}48{.}116$  and these are the controversial

NOTE Confidence: 0.8061445

 $00:11:48.116 \longrightarrow 00:11:49.659$  studies that he's most.

NOTE Confidence: 0.8061445

 $00{:}11{:}49.660 \dashrightarrow 00{:}11{:}51.907$  Well known for, but it's really important.

NOTE Confidence: 0.8061445

 $00:11:51.910 \rightarrow 00:11:54.478$  This is not all that he focused on,

NOTE Confidence: 0.8061445

 $00{:}11{:}54{.}480 \dashrightarrow 00{:}11{:}56{.}706$  because later in his career he also

NOTE Confidence: 0.8061445

 $00{:}11{:}56.706 \dashrightarrow 00{:}11{:}58.671$  studied the importance of other social

NOTE Confidence: 0.8061445

 $00:11:58.671 \rightarrow 00:12:00.897$  relationships and so with his second wife,

NOTE Confidence: 0.8061445

00:12:00.900 --> 00:12:01.530 Margaret Harlow,

- NOTE Confidence: 0.8061445
- $00:12:01.530 \longrightarrow 00:12:03.420$  who developed this really cool apparatus

00:12:03.420 --> 00:12:04.750 called nuclear family housing,

NOTE Confidence: 0.8061445

 $00{:}12{:}04.750 \dashrightarrow 00{:}12{:}06.676$  in which adults and infants lived

NOTE Confidence: 0.8061445

 $00:12:06.676 \rightarrow 00:12:07.960$  in separate apartments here.

NOTE Confidence: 0.8061445

 $00{:}12{:}07{.}960 \dashrightarrow 00{:}12{:}09{.}565$  But the adults were confined

NOTE Confidence: 0.8061445

 $00:12:09.565 \longrightarrow 00:12:10.528$  to their apartments.

NOTE Confidence: 0.8061445

 $00{:}12{:}10.530 \dashrightarrow 00{:}12{:}12.402$  Both the mother and the father

NOTE Confidence: 0.8061445

 $00{:}12{:}12{.}402 \dashrightarrow 00{:}12{:}14{.}318$  and the infants could go through

NOTE Confidence: 0.8061445

 $00{:}12{:}14.318 \dashrightarrow 00{:}12{:}16.118$  this tunnel and play with each

NOTE Confidence: 0.8061445

 $00:12:16.118 \rightarrow 00:12:18.230$  other at will throughout the day.

NOTE Confidence: 0.8061445

 $00:12:18.230 \rightarrow 00:12:21.440$  But at night they would be locked in at home,

NOTE Confidence: 0.8061445

 $00{:}12{:}21.440 \dashrightarrow 00{:}12{:}23.546$  in their apartments with each other.

NOTE Confidence: 0.8061445

 $00:12:23.550 \longrightarrow 00:12:25.620$  And in this way he could

NOTE Confidence: 0.8061445

 $00{:}12{:}25.620 \dashrightarrow 00{:}12{:}27.400$  systematically study the you know,

NOTE Confidence: 0.8061445

 $00{:}12{:}27{.}400 \dashrightarrow 00{:}12{:}29{.}948$  by manipulating the amount of time that

 $00:12:29.948 \rightarrow 00:12:31.950$  infants had exposure to each other.

NOTE Confidence: 0.8061445

 $00{:}12{:}31{.}950 \dashrightarrow 00{:}12{:}34{.}687$  He could study the impacts of peer

NOTE Confidence: 0.8061445

 $00{:}12{:}34.687 \dashrightarrow 00{:}12{:}36.740$  relationships on infant development.

NOTE Confidence: 0.8061445

 $00:12:36.740 \longrightarrow 00:12:38.966$  And so this whole body of work

NOTE Confidence: 0.8061445

 $00:12:38.966 \rightarrow 00:12:40.410$  started to definitively establish

NOTE Confidence: 0.8061445

00:12:40.410 --> 00:12:42.560 the overwhelming importance of early NOTE Confidence: 0.8061445

 $00{:}12{:}42{.}560 \dashrightarrow 00{:}12{:}44{.}727$  social experiences for the development

NOTE Confidence: 0.8061445

 $00:12:44.727 \longrightarrow 00:12:47.049$  of normal behaviors later in life.

NOTE Confidence: 0.83968014

 $00{:}12{:}49{.}780 \dashrightarrow 00{:}12{:}51{.}850$  And beyond establishing that human NOTE Confidence: 0.83968014

 $00{:}12{:}51.850 \dashrightarrow 00{:}12{:}53.506$  psychopathologies can be reproduced NOTE Confidence: 0.83968014

 $00:12:53.506 \rightarrow 00:12:55.528$  in primates and that various

NOTE Confidence: 0.83968014

 $00{:}12{:}55{.}528 \dashrightarrow 00{:}12{:}57{.}458$  social experiences are normal or

NOTE Confidence: 0.83968014

 $00{:}12{:}57{.}458 \dashrightarrow 00{:}12{:}59{.}208$  important for normal development,

NOTE Confidence: 0.83968014

 $00:12:59.210 \longrightarrow 00:13:00.440$  unbeknownst to many,

NOTE Confidence: 0.83968014

 $00:13:00.440 \rightarrow 00:13:02.490$  Harlow also focused on the rapeutics,

NOTE Confidence: 0.83968014

 $00:13:02.490 \rightarrow 00:13:04.912$  and one such example are the series

- NOTE Confidence: 0.83968014
- $00:13:04.912 \longrightarrow 00:13:07.728$  of studies that he and his colleagues
- NOTE Confidence: 0.83968014
- $00{:}13{:}07{.}728 \dashrightarrow 00{:}13{:}09{.}863$  conducted rescuing the social behavior
- NOTE Confidence: 0.83968014
- $00:13:09.863 \rightarrow 00:13:12.739$  of those isolates I mentioned earlier,
- NOTE Confidence: 0.83968014
- $00:13:12.740 \longrightarrow 00:13:15.200$  and so they achieve this through
- NOTE Confidence: 0.83968014
- $00{:}13{:}15{.}200 \dashrightarrow 00{:}13{:}17{.}699$  peer the rapy sessions. And So what?
- NOTE Confidence: 0.83968014
- $00:13:17.699 \rightarrow 00:13:20.660$  You're looking at the top here is.
- NOTE Confidence: 0.83968014
- 00:13:20.660 --> 00:13:22.244 On a social isolate,
- NOTE Confidence: 0.83968014
- $00:13:22.244 \longrightarrow 00:13:24.620$  who until this time had never
- NOTE Confidence: 0.83968014
- 00:13:24.703 --> 00:13:27.158 been exposed to another monkey,
- NOTE Confidence: 0.83968014
- $00:13:27.160 \longrightarrow 00:13:29.686$  very clearly very anxious and withdrawn
- NOTE Confidence: 0.83968014
- $00:13:29.686 \rightarrow 00:13:32.350$  Hereupon initial contact with another infant.
- NOTE Confidence: 0.83968014
- $00{:}13{:}32{.}350 \dashrightarrow 00{:}13{:}34{.}762$  And importantly, the infants were younger
- NOTE Confidence: 0.83968014
- $00:13:34.762 \longrightarrow 00:13:37.110$  than the social isolates themselves,
- NOTE Confidence: 0.83968014
- $00{:}13{:}37{.}110 \dashrightarrow 00{:}13{:}39{.}708$  and after several months of a
- NOTE Confidence: 0.83968014
- $00:13:39.708 \rightarrow 00:13:41.007$  carefully controlled exposure,
- NOTE Confidence: 0.83968014

 $00:13:41.010 \rightarrow 00:13:42.618$  everyday to these peers,

NOTE Confidence: 0.83968014

 $00{:}13{:}42.618 \dashrightarrow 00{:}13{:}45.719$  the isolates then went on to develop

NOTE Confidence: 0.83968014

 $00:13:45.719 \rightarrow 00:13:48.147$  pretty typical social behaviors.

NOTE Confidence: 0.83968014

00:13:48.150 --> 00:13:50.747 And so this whole body of work,

NOTE Confidence: 0.83968014

 $00:13:50.750 \longrightarrow 00:13:52.610$  very fondly referred to this

NOTE Confidence: 0.83968014

 $00:13:52.610 \rightarrow 00:13:54.471$  research trilogy as Love, created,

NOTE Confidence: 0.83968014

00:13:54.471 --> 00:13:56.326 love, destroyed, and Love regained.

NOTE Confidence: 0.83968014

 $00:13:56.330 \rightarrow 00:13:58.568$  And this may sound rather poetic.

NOTE Confidence: 0.83968014

 $00{:}13{:}58{.}570 \dashrightarrow 00{:}13{:}59{.}683$  And in fact,

NOTE Confidence: 0.83968014

00:13:59.683 --> 00:14:01.909 Harlow was really a poetic writer.

NOTE Confidence: 0.83968014

 $00:14:01.910 \longrightarrow 00:14:03.770$  He actually had a speech

NOTE Confidence: 0.83968014

 $00:14:03.770 \longrightarrow 00:14:05.258$  impediment as a child,

NOTE Confidence: 0.83968014

 $00:14:05.260 \longrightarrow 00:14:07.492$  and through many years of teaching

NOTE Confidence: 0.83968014

 $00{:}14{:}07{.}492 \dashrightarrow 00{:}14{:}09{.}564$  as a professor, he overcame that,

NOTE Confidence: 0.83968014

 $00:14:09.564 \rightarrow 00:14:12.269$  and he turned into a prolific and poetic

NOTE Confidence: 0.83968014

 $00{:}14{:}12{.}269 \dashrightarrow 00{:}14{:}14{.}329$  science communicator whose sense of

- NOTE Confidence: 0.83968014
- 00:14:14.329 --> 00:14:16.789 humor carried over into his writing,
- NOTE Confidence: 0.83968014
- $00{:}14{:}16.790 \dashrightarrow 00{:}14{:}18.650$  and let me tell you,
- NOTE Confidence: 0.83968014
- $00{:}14{:}18.650 \dashrightarrow 00{:}14{:}19.248$  Harlow was.
- NOTE Confidence: 0.83968014
- 00:14:19.248 --> 00:14:19.547 Hilarious,
- NOTE Confidence: 0.83968014

 $00{:}14{:}19{.}547 \dashrightarrow 00{:}14{:}22{.}179$  so I also stumbled upon in the background

NOTE Confidence: 0.83968014

 $00{:}14{:}22.179 \dashrightarrow 00{:}14{:}24.079$  research for this presentation.

NOTE Confidence: 0.83968014

 $00:14:24.080 \rightarrow 00:14:26.648$  This article by Harlow comparing different

NOTE Confidence: 0.83968014

 $00:14:26.648 \longrightarrow 00:14:28.895$  cognitive abilities of primates in the

NOTE Confidence: 0.83968014

 $00{:}14{:}28.895 \dashrightarrow 00{:}14{:}31.430$  early zoos that he worked in in in Wisconsin.

- NOTE Confidence: 0.83968014
- $00:14:31.430 \longrightarrow 00:14:33.530$  Now you might notice the publication
- NOTE Confidence: 0.83968014
- 00:14:33.530 --> 00:14:34.230 date 2008,
- NOTE Confidence: 0.83968014
- $00{:}14{:}34{.}230 \dashrightarrow 00{:}14{:}36{.}330$  but he died in the 80s,
- NOTE Confidence: 0.83968014
- $00:14:36.330 \longrightarrow 00:14:38.430$  so actually this was published posthumously.
- NOTE Confidence: 0.83968014
- $00{:}14{:}38{.}430 \dashrightarrow 00{:}14{:}40{.}530$  It was found in his archives,
- NOTE Confidence: 0.83968014
- $00{:}14{:}40{.}530 \dashrightarrow 00{:}14{:}42{.}630$  an article he had never published.
- NOTE Confidence: 0.83968014

00:14:42.630 --> 00:14:44.380 An was published in 2008,

NOTE Confidence: 0.83968014

 $00:14:44.380 \rightarrow 00:14:47.179$  so I want to give you a little glimpse

NOTE Confidence: 0.83968014

 $00:14:47.179 \longrightarrow 00:14:49.686$  of how he could both entertain.

NOTE Confidence: 0.83968014

00:14:49.690 --> 00:14:51.170 While educating his audience,

NOTE Confidence: 0.83968014

 $00{:}14{:}51{.}170 \dashrightarrow 00{:}14{:}53{.}708$  the performance of the two chimpanzees was

NOTE Confidence: 0.83968014

 $00{:}14{:}53.708 \dashrightarrow 00{:}14{:}55.788$  no better than the best of The Monkees.

NOTE Confidence: 0.83968014

00:14:55.790 --> 00:14:56.101 Furthermore,

NOTE Confidence: 0.83968014

 $00{:}14{:}56{.}101 \dashrightarrow 00{:}14{:}57{.}656$  the chimpanzees never seemed to

NOTE Confidence: 0.83968014

 $00{:}14{:}57.656 \dashrightarrow 00{:}15{:}00.260$  really get down to work and put their

NOTE Confidence: 0.83968014

 $00:15:00.260 \rightarrow 00:15:01.568$  hearts into psychological testing.

NOTE Confidence: 0.83968014

00:15:01.570 --> 00:15:03.915 At the time we attributed their good

NOTE Confidence: 0.83968014

 $00:15:03.915 \longrightarrow 00:15:05.573$  natured distract ability to their

NOTE Confidence: 0.83968014

 $00{:}15{:}05{.}573 \dashrightarrow 00{:}15{:}07{.}343$  age instead of the obvious answer.

NOTE Confidence: 0.83968014

 $00:15:07.350 \rightarrow 00:15:11.040$  The fact that they were chimpanzees.

NOTE Confidence: 0.83968014

 $00:15:11.040 \longrightarrow 00:15:13.002$  And then here's one more which

NOTE Confidence: 0.83968014

 $00:15:13.002 \rightarrow 00:15:15.040$  really starts to explain why rhesus

- NOTE Confidence: 0.83968014
- $00:15:15.040 \rightarrow 00:15:17.044$  monkeys are such a superior model.

00:15:17.050 --> 00:15:18.970 The rhesus monkey lacks the gay

NOTE Confidence: 0.83968014

00:15:18.970 --> 00:15:20.730 abandoned of the cebus monkey,

NOTE Confidence: 0.83968014

 $00:15:20.730 \longrightarrow 00:15:22.395$  the elegant grace and composure

NOTE Confidence: 0.83968014

 $00:15:22.395 \longrightarrow 00:15:23.394$  of the spider,

NOTE Confidence: 0.83968014

 $00:15:23.400 \rightarrow 00:15:25.398$  or the buffoonery of the chimpanzee.

NOTE Confidence: 0.83968014

 $00:15:25.400 \longrightarrow 00:15:27.374$  But beneath the Gray or grim

NOTE Confidence: 0.83968014

 $00:15:27.374 \rightarrow 00:15:29.771$  exterior of the recess is a central

NOTE Confidence: 0.83968014

 $00{:}15{:}29{.}771 \dashrightarrow 00{:}15{:}31{.}451$  nervous system waiting to grind

NOTE Confidence: 0.83968014

 $00:15:31.451 \longrightarrow 00:15:33.419$  out 100 test trials of day.

NOTE Confidence: 0.83968014

 $00:15:33.420 \longrightarrow 00:15:34.895$  The difference between a cebus

NOTE Confidence: 0.83968014

 $00{:}15{:}34.895 \dashrightarrow 00{:}15{:}37.088$  monkey and a Reese's is all the

NOTE Confidence: 0.83968014

00:15:37.088 --> 00:15:38.728 difference between a southern Belle

NOTE Confidence: 0.83968014

00:15:38.728 --> 00:15:40.430 Anna New England storekeeper.

NOTE Confidence: 0.83968014

 $00:15:40.430 \longrightarrow 00:15:41.696$  Our primary interest,

 $00:15:41.696 \rightarrow 00:15:43.384$  concerned learning and intelligence.

NOTE Confidence: 0.83968014

00:15:43.390 --> 00:15:45.665 So those are just some examples of

NOTE Confidence: 0.83968014

00:15:45.665 --> 00:15:47.925 the types of writing that I wish

NOTE Confidence: 0.83968014

 $00:15:47.925 \rightarrow 00:15:50.242$  we saw more of today and beyond

NOTE Confidence: 0.83968014

 $00{:}15{:}50{.}242 \dashrightarrow 00{:}15{:}52{.}768$  explaining some of the reasons why NOTE Confidence: 0.83968014

 $00{:}15{:}52.768 \dashrightarrow 00{:}15{:}54.750$  rhesus monkeys were great models.

NOTE Confidence: 0.83968014

00:15:54.750 --> 00:15:57.235 We now know even more why there,

NOTE Confidence: 0.85351914

 $00:15:57.240 \longrightarrow 00:15:58.980$  why there's such reliable

NOTE Confidence: 0.85351914

 $00{:}15{:}58{.}980 \dashrightarrow 00{:}16{:}01{.}590$  models for the study of humans.

NOTE Confidence: 0.85351914

00:16:01.590 --> 00:16:03.345 One reason is that r<br/>hesus

NOTE Confidence: 0.85351914

00:16:03.345 --> 00:16:05.100 macaques second only to humans,

NOTE Confidence: 0.85351914

 $00{:}16{:}05{.}100 \dashrightarrow 00{:}16{:}07{.}206$  are second only to humans in

NOTE Confidence: 0.85351914

 $00{:}16{:}07.206 \dashrightarrow 00{:}16{:}08.259$  their geographic distribution.

NOTE Confidence: 0.85351914

 $00:16:08.260 \longrightarrow 00:16:10.330$  So there's the second most widely

NOTE Confidence: 0.85351914

 $00:16:10.330 \rightarrow 00:16:12.120$  distributed primate in the world,

NOTE Confidence: 0.85351914

 $00:16:12.120 \longrightarrow 00:16:13.875$  and you could see their

 $00:16:13.875 \longrightarrow 00:16:15.630$  distribution here on this map.

NOTE Confidence: 0.82088697

00:16:18.060 --> 00:16:20.220 Rhesus macaque San humans also share

NOTE Confidence: 0.82088697

00:16:20.220 --> 00:16:23.019 a high degree of genetic similarity,

NOTE Confidence: 0.82088697

 $00:16:23.020 \rightarrow 00:16:25.848$  about 93%, and in fact there are

NOTE Confidence: 0.82088697

 $00:16:25.848 \rightarrow 00:16:27.960$  some polymorphisms that are unique

NOTE Confidence: 0.82088697

 $00{:}16{:}27.960 \dashrightarrow 00{:}16{:}30.444$  only to humans and rhesus macaques.

NOTE Confidence: 0.8691292

 $00{:}16{:}32{.}900 \dashrightarrow 00{:}16{:}35{.}490$  Another limiting factor in human studies is

NOTE Confidence: 0.8691292

 $00:16:35.490 \rightarrow 00:16:38.760$  a very long life span that humans have now.

NOTE Confidence: 0.8691292

 $00{:}16{:}38.760 \dashrightarrow 00{:}16{:}41.021$  This makes it really difficult to study

NOTE Confidence: 0.8691292

 $00:16:41.021 \rightarrow 00:16:43.273$  the same people continuously across the

NOTE Confidence: 0.8691292

 $00{:}16{:}43.273 \dashrightarrow 00{:}16{:}45.703$  lifespan and to get repeated sampling.

NOTE Confidence: 0.8691292

00:16:45.710 --> 00:16:46.808 Whether it's biological

NOTE Confidence: 0.8691292

 $00{:}16{:}46.808 \dashrightarrow 00{:}16{:}47.906$  or behavioral measures.

NOTE Confidence: 0.8691292

 $00{:}16{:}47{.}910 \dashrightarrow 00{:}16{:}49{.}740$  But rhesus monkeys develop approximately

NOTE Confidence: 0.8691292

 $00:16:49.740 \longrightarrow 00:16:51.570$  4 times faster than humans,

 $00:16:51.570 \dashrightarrow 00:16:53.826$  and so this makes the study of life

NOTE Confidence: 0.8691292

 $00{:}16{:}53.826 \dashrightarrow 00{:}16{:}55.377$  course an intergenerational studies

NOTE Confidence: 0.8691292

 $00{:}16{:}55{.}377 \dashrightarrow 00{:}16{:}58{.}149$  possible in a shorter time frame.

NOTE Confidence: 0.8691292

 $00{:}16{:}58{.}150 \dashrightarrow 00{:}17{:}00{.}453$  And the monkeys I'm showing you here

NOTE Confidence: 0.8691292

 $00:17:00.453 \rightarrow 00:17:03.020$  are some of my absolute favorites.

NOTE Confidence: 0.8691292

00:17:03.020 --> 00:17:04.550 From my work in Maryland,

NOTE Confidence: 0.8691292

00:17:04.550 --> 00:17:06.386 this is my very favorite monkey

NOTE Confidence: 0.8691292

 $00{:}17{:}06{.}386 \dashrightarrow 00{:}17{:}07{.}901$  mom of all time, Xena,

NOTE Confidence: 0.8691292

00:17:07.901 --> 00:17:09.938 with her infant Zinnia in 2008 and

NOTE Confidence: 0.8691292

00:17:09.938 --> 00:17:12.102 just six years later as India had

NOTE Confidence: 0.8691292

 $00{:}17{:}12.102 \dashrightarrow 00{:}17{:}14.040$  her own first infant named Rufus.

NOTE Confidence: 0.8691292

 $00{:}17{:}14.040 \dashrightarrow 00{:}17{:}17.082$  And so we were able to study this whole

NOTE Confidence: 0.8691292

 $00:17:17.082 \rightarrow 00:17:20.289$  family together within just a few years time.

NOTE Confidence: 0.8691292

00:17:20.290 --> 00:17:22.350 And as mentioned earlier,

NOTE Confidence: 0.8691292

00:17:22.350 --> 00:17:23.380 nonhuman primates,

NOTE Confidence: 0.8691292

00:17:23.380 --> 00:17:24.318 particularly macaques,

- NOTE Confidence: 0.8691292
- $00:17:24.318 \longrightarrow 00:17:27.132$  have complex cognitive abilities as well
- NOTE Confidence: 0.8691292
- $00{:}17{:}27{.}132 \dashrightarrow 00{:}17{:}30{.}587$  as very complex social behavioral repertoire,
- NOTE Confidence: 0.8691292
- $00{:}17{:}30{.}590 \dashrightarrow 00{:}17{:}31{.}692$  which are,
- NOTE Confidence: 0.8691292
- $00:17:31.692 \rightarrow 00:17:36.100$  which are made possible due to their nerdy
- NOTE Confidence: 0.8691292
- $00{:}17{:}36.205 \dashrightarrow 00{:}17{:}40.260$  nuro anatomical similarities to humans.
- NOTE Confidence: 0.8691292
- $00{:}17{:}40.260 \dashrightarrow 00{:}17{:}42.552$  So Harlow's legacy was really far
- NOTE Confidence: 0.8691292
- $00:17:42.552 \rightarrow 00:17:45.606$  reaching and it still is to this day
- NOTE Confidence: 0.8691292
- $00:17:45.606 \rightarrow 00:17:47.778$  his research has provided an enduring
- NOTE Confidence: 0.8691292
- $00:17:47.848 \longrightarrow 00:17:50.353$  empirical foundation for future work
- NOTE Confidence: 0.8691292
- $00{:}17{:}50{.}353 \dashrightarrow 00{:}17{:}52{.}858$  because of his foundational studies
- NOTE Confidence: 0.8691292
- $00:17:52.860 \rightarrow 00:17:54.960$  into the formation of attachment.
- NOTE Confidence: 0.8691292
- $00{:}17{:}54{.}960 \dashrightarrow 00{:}17{:}57{.}613$  We now as scientists can study the
- NOTE Confidence: 0.8691292
- $00:17:57.613 \rightarrow 00:17:59.580$  interactions of childhood experiences,
- NOTE Confidence: 0.8691292
- 00:17:59.580 --> 00:18:01.110 genetics, biological factors,
- NOTE Confidence: 0.8691292
- $00{:}18{:}01{.}110 \dashrightarrow 00{:}18{:}04{.}680$  and epigenetics just to give some examples.
- NOTE Confidence: 0.8691292

00:18:04.680 --> 00:18:07.207 We're also able and wanting to study

NOTE Confidence: 0.8691292

 $00{:}18{:}07{.}207 \dashrightarrow 00{:}18{:}09{.}650$  the vulnerability of children or their

NOTE Confidence: 0.8691292

00:18:09.650 --> 00:18:11.805 resilience and recovery in various

NOTE Confidence: 0.8691292

 $00:18:11.805 \rightarrow 00:18:13.998$  health outcomes across the lifespan,

NOTE Confidence: 0.8691292

 $00{:}18{:}14.000 \dashrightarrow 00{:}18{:}16.025$  and scientists today can answer

NOTE Confidence: 0.8691292

 $00{:}18{:}16.025 \dashrightarrow 00{:}18{:}18.050$  questions that Harlow could not,

NOTE Confidence: 0.8691292

 $00:18:18.050 \rightarrow 00:18:20.070$  because since his foundational studies,

NOTE Confidence: 0.8691292

 $00:18:20.070 \rightarrow 00:18:23.136$  we've seen an evolution and such

NOTE Confidence: 0.8691292

00:18:23.136 --> 00:18:25.180 techniques like a neuroimaging

NOTE Confidence: 0.8691292

 $00:18:25.269 \rightarrow 00:18:27.300$  and epigenetics research.

NOTE Confidence: 0.8691292

00:18:27.300 --> 00:18:31.160 An his legacy of knowledge.

NOTE Confidence: 0.8691292

00:18:31.160 --> 00:18:33.365 Really illustrate is really illustrated

NOTE Confidence: 0.8691292

00:18:33.365 - 00:18:35.982 here in this graphic that shows

NOTE Confidence: 0.8691292

 $00{:}18{:}35{.}982 \dashrightarrow 00{:}18{:}38{.}355$  just how far reaching his work is.

NOTE Confidence: 0.8691292

00:18:38.360 --> 00:18:40.604 He's had over 10,000 citations of

NOTE Confidence: 0.8691292

00:18:40.604 --> 00:18:43.160 his work and almost 7000 articles,

- NOTE Confidence: 0.8691292
- $00:18:43.160 \rightarrow 00:18:45.589$  and you can see the disciplines that

 $00{:}18{:}45{.}589 \dashrightarrow 00{:}18{:}48{.}441$  his work are cited in here and some

NOTE Confidence: 0.8691292

00:18:48.441 - 00:18:50.833 of the more interesting or obscur

NOTE Confidence: 0.8691292

 $00:18:50.833 \rightarrow 00:18:53.157$  ones include educational research,

NOTE Confidence: 0.8691292

 $00:18:53.160 \longrightarrow 00:18:54.360$  endocrinology, and metabolism,

NOTE Confidence: 0.8691292

 $00:18:54.360 \rightarrow 00:18:56.360$  general internal medicine among others,

NOTE Confidence: 0.8691292

 $00:18:56.360 \longrightarrow 00:18:58.691$  and so this is really a testament

NOTE Confidence: 0.8691292

 $00:18:58.691 \rightarrow 00:19:01.351$  to how science continues to build

NOTE Confidence: 0.8691292

 $00:19:01.351 \longrightarrow 00:19:02.407$  upon understanding.

NOTE Confidence: 0.8691292

 $00:19:02.410 \longrightarrow 00:19:03.658$  Formed in the past.

NOTE Confidence: 0.7759845

00:19:06.040 --> 00:19:08.170 Now Harry's legacy, of course,

NOTE Confidence: 0.7759845

00:19:08.170 --> 00:19:10.290 was embodied in his trainees.

NOTE Confidence: 0.7759845

00:19:10.290 --> 00:19:13.447 Fun fact, his very first PhD student

NOTE Confidence: 0.7759845

00:19:13.447 --> 00:19:16.032 was Abraham Maslow who developed

NOTE Confidence: 0.7759845

 $00{:}19{:}16.032 \dashrightarrow 00{:}19{:}18.328$  Maslow's hierarchy of needs.

- 00:19:18.330 --> 00:19:19.174 His dissertation,
- NOTE Confidence: 0.7759845
- $00:19:19.174 \longrightarrow 00:19:21.284$  the role of dominance in
- NOTE Confidence: 0.7759845
- $00:19:21.284 \longrightarrow 00:19:23.250$  social behavior of primates.
- NOTE Confidence: 0.7759845
- $00:19:23.250 \longrightarrow 00:19:25.026$  But of course Harlow had other
- NOTE Confidence: 0.7759845
- 00:19:25.026 --> 00:19:26.869 proteges who carried on his legacy,
- NOTE Confidence: 0.7759845
- $00{:}19{:}26.870 \dashrightarrow 00{:}19{:}28.966$  and this legacy is continued not in his
- NOTE Confidence: 0.7759845
- 00:19:28.966 --> 00:19:30.499 original severe deprivation studies,
- NOTE Confidence: 0.7759845
- 00:19:30.500 --> 00:19:32.908 because no one wants to do those anymore,
- NOTE Confidence: 0.7759845
- $00:19:32.910 \longrightarrow 00:19:35.326$  and no one has done them for many,
- NOTE Confidence: 0.7759845
- 00:19:35.330 --> 00:19:36.010 many years.
- NOTE Confidence: 0.7759845
- $00{:}19{:}36{.}010 \dashrightarrow 00{:}19{:}38{.}390$  But he trained his students in the
- NOTE Confidence: 0.7759845
- $00:19:38.390 \rightarrow 00:19:40.112$  rigorous and carefully research
- NOTE Confidence: 0.7759845
- $00:19:40.112 \longrightarrow 00:19:42.746$  techniques to isolate how early life
- NOTE Confidence: 0.7759845
- $00:19:42.746 \rightarrow 00:19:44.608$  experiences shape lifelong health,
- NOTE Confidence: 0.7759845
- $00{:}19{:}44.610 \dashrightarrow 00{:}19{:}46.824$  and some of these trainees include
- NOTE Confidence: 0.7759845
- $00:19:46.824 \rightarrow 00:19:49.086$  his postdoc and undergrad Jim Sackett

- NOTE Confidence: 0.7759845
- 00:19:49.086 --> 00:19:50.896 and Jerry Ruppenthal who moved
- NOTE Confidence: 0.7759845
- 00:19:50.896 --> 00:19:53.138 together in 1970 from Wiscons<br/>in to
- NOTE Confidence: 0.7759845
- 00:19:53.138 --> 00:19:54.948 launch the infant Primate Research
- NOTE Confidence: 0.7759845
- $00:19:54.948 \dashrightarrow 00:19:57.152$  Lab at the University of Washington,
- NOTE Confidence: 0.7759845
- $00:19:57.152 \rightarrow 00:20:00.224$  which still to this day, is the nation.
- NOTE Confidence: 0.7759845
- $00{:}20{:}00{.}224 \dashrightarrow 00{:}20{:}03{.}080$  Only 24 hours staffed infant primate lab.
- NOTE Confidence: 0.7759845
- 00:20:03.080 --> 00:20:05.150 He also trained Melinda Novak,
- NOTE Confidence: 0.7759845
- $00:20:05.150 \longrightarrow 00:20:07.460$  who after graduating a retaining her
- NOTE Confidence: 0.7759845
- $00{:}20{:}07{.}460 \dashrightarrow 00{:}20{:}10{.}389$  PhD moved to UM ass Amherst where she
- NOTE Confidence: 0.7759845
- 00:20:10.389 --> 00:20:12.579 recently just retired last year.
- NOTE Confidence: 0.7759845
- $00{:}20{:}12.580 \dashrightarrow 00{:}20{:}15.282$  But for the duration of her career
- NOTE Confidence: 0.7759845
- $00:20:15.282 \longrightarrow 00:20:17.539$  ran a small primate lab,
- NOTE Confidence: 0.7759845
- $00{:}20{:}17.540 \dashrightarrow 00{:}20{:}19.732$  looking at primate cognition
- NOTE Confidence: 0.7759845
- $00{:}20{:}19.732 \dashrightarrow 00{:}20{:}21.924$  and psychological well being.
- NOTE Confidence: 0.7759845
- 00:20:21.930 --> 00:20:23.870 And he trained Steve Suming,
- NOTE Confidence: 0.7759845
$00{:}20{:}23.870 \dashrightarrow 00{:}20{:}25.810$  who Appan leaving Wisconsin started

NOTE Confidence: 0.7759845

 $00:20:25.810 \longrightarrow 00:20:27.750$  the lab of comparative mythology.

NOTE Confidence: 0.7759845

 $00:20:27.750 \longrightarrow 00:20:28.881$  Mythology at NIH,

NOTE Confidence: 0.7759845

 $00{:}20{:}28{.}881 \dashrightarrow 00{:}20{:}32{.}020$  which was an operation for about 35 years,

NOTE Confidence: 0.7759845

 $00{:}20{:}32.020 \dashrightarrow 00{:}20{:}34.420$  and these people are very important

NOTE Confidence: 0.7759845

 $00:20:34.420 \rightarrow 00:20:37.449$  because they are the ones who raised me,

NOTE Confidence: 0.7759845

 $00:20:37.450 \longrightarrow 00:20:39.930$  at least academically and

NOTE Confidence: 0.7759845

00:20:39.930 --> 00:20:41.170 professionally speaking.

NOTE Confidence: 0.7759845

 $00{:}20{:}41.170 \dashrightarrow 00{:}20{:}42.124$  Andres is right.

NOTE Confidence: 0.7759845

 $00{:}20{:}42.124 \dashrightarrow 00{:}20{:}44.747$  I just happened to be sitting in an

NOTE Confidence: 0.7759845

00:20:44.747 $\operatorname{-->}$ 00:20:47.064 animal behavior class when I was an

NOTE Confidence: 0.7759845

00:20:47.064 --> 00:20:49.220 undergrad in zoology at University,

NOTE Confidence: 0.7759845

00:20:49.220 --> 00:20:49.570 Washington,

NOTE Confidence: 0.7759845

 $00{:}20{:}49{.}570 \dashrightarrow 00{:}20{:}50{.}970$  and the professor mentioned

NOTE Confidence: 0.7759845

00:20:50.970 --> 00:20:52.020 infant primate lab.

NOTE Confidence: 0.7759845

 $00:20:52.020 \rightarrow 00:20:54.470$  So to conducted my undergrad research there,

- NOTE Confidence: 0.7759845
- $00{:}20{:}54{.}470 \dashrightarrow 00{:}20{:}56{.}920$  I obtained my Masters and PhD in

 $00{:}20{:}56{.}920 \dashrightarrow 00{:}20{:}58{.}364$  behavioral neuroscience under the

NOTE Confidence: 0.7759845

 $00{:}20{:}58{.}364 \dashrightarrow 00{:}21{:}01{.}056$  guidance of Melinda Novak, and I did it.

NOTE Confidence: 0.7759845

 $00{:}21{:}01{.}056 \dashrightarrow 00{:}21{:}02{.}726$  My second postdoctoral fellowship in

NOTE Confidence: 0.7759845

00:21:02.726 --> 00:21:04.945 Steve Sumes lab and my work broadens

NOTE Confidence: 0.7759845

 $00{:}21{:}04{.}945 \dashrightarrow 00{:}21{:}06{.}622$  the concept of early attachments

NOTE Confidence: 0.7759845

 $00:21:06.622 \longrightarrow 00:21:09.016$  to focus on multiple early life

NOTE Confidence: 0.7759845

 $00:21:09.016 \rightarrow 00:21:10.570$  experiences that shaped lifelong

NOTE Confidence: 0.7759845

 $00{:}21{:}10.570 \dashrightarrow 00{:}21{:}11.620$  and intergenerational health.

NOTE Confidence: 0.84201616

00:21:13.880 --> 00:21:16.771 So my research goals are to identify

NOTE Confidence: 0.84201616

 $00:21:16.771 \rightarrow 00:21:19.080$  causal mechanisms linking variable early,

NOTE Confidence: 0.84201616

 $00{:}21{:}19.080 \dashrightarrow 00{:}21{:}21.205$  early life experiences to health

NOTE Confidence: 0.84201616

 $00:21:21.205 \longrightarrow 00:21:23.330$  outcomes later in life and

NOTE Confidence: 0.84201616

 $00{:}21{:}23{.}405 \dashrightarrow 00{:}21{:}25{.}997$  adolescence and all hood and beyond,

NOTE Confidence: 0.84201616

 $00{:}21{:}26.000 \dashrightarrow 00{:}21{:}28.170$  and these health outcomes, importantly,

00:21:28.170 --> 00:21:30.330 are both behavioral and physical,

NOTE Confidence: 0.84201616

00:21:30.330 --> 00:21:33.368 and when I say early life experiences,

NOTE Confidence: 0.84201616

00:21:33.370 --> 00:21:35.981 I really mean a wide ranging of

NOTE Confidence: 0.84201616

00:21:35.981 - > 00:21:38.559 swath of early life experiences,

NOTE Confidence: 0.84201616

 $00{:}21{:}38.560 \dashrightarrow 00{:}21{:}41.290$  from prenatal and post Natal stress to

NOTE Confidence: 0.84201616

 $00:21:41.290 \rightarrow 00:21:43.829$  various variations in maternal experience.

NOTE Confidence: 0.84201616

00:21:43.830 --> 00:21:45.130 Two naturally occurring variations

NOTE Confidence: 0.84201616

 $00:21:45.130 \rightarrow 00:21:46.430$  and mother's milk composition,

NOTE Confidence: 0.84201616

 $00{:}21{:}46{.}430 \dashrightarrow 00{:}21{:}48{.}055$  as well as the influence

NOTE Confidence: 0.84201616

00:21:48.055 --> 00:21:49.030 of early attachments.

NOTE Confidence: 0.84201616

 $00{:}21{:}49{.}030 \dashrightarrow 00{:}21{:}51{.}750$  And though I would really love to talk

NOTE Confidence: 0.84201616

 $00{:}21{:}51{.}750 \dashrightarrow 00{:}21{:}53{.}907$  about findings on all of these today,

NOTE Confidence: 0.84201616

 $00:21:53.910 \longrightarrow 00:21:56.622$  I'll just be focusing on the

NOTE Confidence: 0.84201616

 $00:21:56.622 \rightarrow 00:21:58.430$  influence of early attachments.

NOTE Confidence: 0.84201616

 $00:21:58.430 \longrightarrow 00:22:01.125$  So this body of work I've been

NOTE Confidence: 0.84201616

00:22:01.125 --> 00:22:03.100 fortunate to conduct because of

00:22:03.100 - 00:22:05.683 my time spent in Steve Sumes lab,

NOTE Confidence: 0.84201616

 $00:22:05.690 \longrightarrow 00:22:08.448$  which was an operation from 1983 until

NOTE Confidence: 0.84201616

 $00:22:08.448 \longrightarrow 00:22:11.373$  just a couple of years ago when he

NOTE Confidence: 0.84201616

00:22:11.373 --> 00:22:13.527 retired and this was an intramural

NOTE Confidence: 0.84201616

 $00{:}22{:}13.527 \dashrightarrow 00{:}22{:}16.376$  research lab at the NCH Dee Ann.

NOTE Confidence: 0.84201616

 $00{:}22{:}16.380 \dashrightarrow 00{:}22{:}18.445$  Its three major goals were to study

NOTE Confidence: 0.84201616

 $00{:}22{:}18.445 \dashrightarrow 00{:}22{:}20.345$  the genetic and environmental factors

NOTE Confidence: 0.84201616

 $00{:}22{:}20{.}345 \dashrightarrow 00{:}22{:}22{.}245$  that shape individual developmental

NOTE Confidence: 0.84201616

 $00{:}22{:}22{.}245 \dashrightarrow 00{:}22{:}24{.}563$  trajectories and also to examine

NOTE Confidence: 0.84201616

00:22:24.563 - > 00:22:26.699 both the continuity and the change,

NOTE Confidence: 0.84201616

 $00:22:26.700 \longrightarrow 00:22:28.476$  that is to say,

NOTE Confidence: 0.84201616

 $00{:}22{:}28.476 \dashrightarrow 00{:}22{:}30.696$  those stability of individual differences.

NOTE Confidence: 0.84201616

 $00{:}22{:}30.700 \dashrightarrow 00{:}22{:}33.070$  Cross development and finally of

NOTE Confidence: 0.84201616

 $00{:}22{:}33.070 \dashrightarrow 00{:}22{:}35.985$  course to identify the degree of

NOTE Confidence: 0.84201616

 $00{:}22{:}35{.}985 \dashrightarrow 00{:}22{:}38{.}315$  generalizability to both wild monkeys

 $00:22:38.315 \rightarrow 00:22:41.408$  and for our purposes here to humans.

NOTE Confidence: 0.84201616

 $00:22:41.410 \longrightarrow 00:22:43.321$  And we were able to achieve this

NOTE Confidence: 0.84201616

 $00:22:43.321 \rightarrow 00:22:44.955$  because we could tightly control

NOTE Confidence: 0.84201616

 $00:22:44.955 \longrightarrow 00:22:46.850$  the early life experiences that

NOTE Confidence: 0.84201616

 $00:22:46.850 \longrightarrow 00:22:48.210$  monkeys were exposed to,

NOTE Confidence: 0.84201616

00:22:48.210 --> 00:22:50.578 and I'm going to take a few moments

NOTE Confidence: 0.84201616

 $00{:}22{:}50{.}578 \dashrightarrow 00{:}22{:}53{.}062$  to describe those in details so they

NOTE Confidence: 0.84201616

 $00{:}22{:}53.062 \dashrightarrow 00{:}22{:}54.887$  have a firm understanding because

NOTE Confidence: 0.84201616

 $00{:}22{:}54{.}957 \dashrightarrow 00{:}22{:}57{.}285$  they matter for the rest of the talk.

NOTE Confidence: 0.84201616

 $00{:}22{:}57{.}290 \dashrightarrow 00{:}22{:}59{.}490$  So for in our lab the rhesus monkeys

NOTE Confidence: 0.84201616

 $00{:}22{:}59{.}490 \dashrightarrow 00{:}23{:}01{.}229$  were randomly assigned to experience

NOTE Confidence: 0.84201616

 $00{:}23{:}01{.}229 \dashrightarrow 00{:}23{:}03{.}119$  one of three rearing conditions.

NOTE Confidence: 0.84201616

 $00{:}23{:}03{.}120 \dashrightarrow 00{:}23{:}06{.}027$  For the first eight to 10 months of life.

NOTE Confidence: 0.84201616

 $00:23:06.030 \rightarrow 00:23:08.515$  Now on average we would have approximately

NOTE Confidence: 0.84201616

 $00{:}23{:}08{.}515 \dashrightarrow 00{:}23{:}11{.}268$  40 infants per year born into the colony.

NOTE Confidence: 0.84201616

00:23:11.270 --> 00:23:11.582 Anne,

 $00:23:11.582 \longrightarrow 00:23:13.766$  randomly 50% of these would be mother,

NOTE Confidence: 0.84201616

 $00:23:13.770 \longrightarrow 00:23:14.084$  period.

NOTE Confidence: 0.84201616

 $00{:}23{:}14.084 \dashrightarrow 00{:}23{:}15.968$  This was our control condition Reardon.

NOTE Confidence: 0.84201616

 $00:23:15.970 \rightarrow 00:23:18.154$  Social groups with many other adult females,

NOTE Confidence: 0.84201616

 $00{:}23{:}18.160 \dashrightarrow 00{:}23{:}19.720$  adult males and other infants.

NOTE Confidence: 0.84201616

 $00{:}23{:}19{.}720 \dashrightarrow 00{:}23{:}22{.}121$  The other 50% would be randomly assigned

NOTE Confidence: 0.84201616

 $00{:}23{:}22{.}121 \dashrightarrow 00{:}23{:}24{.}394$  to experience a nursery ring for the

NOTE Confidence: 0.84201616

 $00:23:24.394 \rightarrow 00:23:26.801$  first eight to 10 months of life and

NOTE Confidence: 0.84201616

 $00{:}23{:}26{.}801 \dashrightarrow 00{:}23{:}28{.}817$  so from birth they would either be

NOTE Confidence: 0.84201616

 $00:23:28.817 \longrightarrow 00:23:30.680$  one of two nursery reared formats.

NOTE Confidence: 0.84201616

00:23:30.680 --> 00:23:32.426 The first is peer rearing and

NOTE Confidence: 0.84201616

 $00{:}23{:}32{.}426 \dashrightarrow 00{:}23{:}34{.}120$  the 2nd is surrogate peering.

NOTE Confidence: 0.84201616

 $00{:}23{:}34{.}120 \dashrightarrow 00{:}23{:}36{.}206$  So after the first month of life

NOTE Confidence: 0.84201616

 $00{:}23{:}36{.}206 \dashrightarrow 00{:}23{:}37{.}811$  where infants could Thermo regulate

NOTE Confidence: 0.84201616

00:23:37.811 -> 00:23:39.749 and self feed in the nursery,

 $00:23:39.750 \longrightarrow 00:23:41.410$  they were then either randomly

NOTE Confidence: 0.84201616

 $00:23:41.410 \longrightarrow 00:23:43.700$  assigned to be period where they were.

NOTE Confidence: 0.84201616

 $00{:}23{:}43.700 \dashrightarrow 00{:}23{:}45.620$  A house with other peers from

NOTE Confidence: 0.84201616

 $00:23:45.620 \longrightarrow 00:23:47.738$  three other peers 24 hours a day.

NOTE Confidence: 0.84201616

 $00:23:47.740 \longrightarrow 00:23:49.588$  Or they were housed in a single

NOTE Confidence: 0.84201616

00:23:49.588 --> 00:23:51.514 cage with a cloth covered surrogate

NOTE Confidence: 0.84201616

 $00:23:51.514 \longrightarrow 00:23:53.644$  for the majority of the day.

NOTE Confidence: 0.84201616

 $00:23:53.650 \rightarrow 00:23:55.996$  But given daily play sessions with

NOTE Confidence: 0.84201616

 $00{:}23{:}55{.}996 \dashrightarrow 00{:}23{:}58{.}269$  other surrogate period animals so they

NOTE Confidence: 0.84201616

 $00:23:58.269 \rightarrow 00:24:00.516$  do not have continual exposure to peers.

NOTE Confidence: 0.84201616

 $00{:}24{:}00{.}520 \dashrightarrow 00{:}24{:}04{.}088$  Now the research over the decades has has.

NOTE Confidence: 0.83654696

 $00:24:06.960 \longrightarrow 00:24:08.270$  Has shown us that period

NOTE Confidence: 0.83654696

 $00:24:08.270 \rightarrow 00:24:10.031$  monkeys actually go on to become

NOTE Confidence: 0.83654696

 $00{:}24{:}10.031 \dashrightarrow 00{:}24{:}11.996$  exceptionally dependent on each other,

NOTE Confidence: 0.83654696

 $00{:}24{:}12.000 \dashrightarrow 00{:}24{:}13.908$  hyper dependent and the reason for

NOTE Confidence: 0.83654696

 $00:24:13.908 \longrightarrow 00:24:16.475$  that is because they both act as the

00:24:16.475 --> 00:24:18.317 secure attachment base for each other

NOTE Confidence: 0.83654696

00:24:18.377 --> 00:24:20.526 and they have a need for attachment

NOTE Confidence: 0.83654696

 $00{:}24{:}20{.}526 \dashrightarrow 00{:}24{:}22{.}395$  so they're unable to break physically

NOTE Confidence: 0.83654696

 $00:24:22.395 \longrightarrow 00:24:24.285$  to break apart from each other.

NOTE Confidence: 0.83654696

00:24:24.290 --> 00:24:26.126 Starting at very young ages because

NOTE Confidence: 0.83654696

 $00{:}24{:}26.126$  -->  $00{:}24{:}28.735$  of the need of others to cling on to

NOTE Confidence: 0.83654696

 $00{:}24{:}28.735 \dashrightarrow 00{:}24{:}31.206$  them and so they just kind of form

NOTE Confidence: 0.83654696

 $00{:}24{:}31{.}206 \dashrightarrow 00{:}24{:}33{.}016$  these huddling clusters of monkeys

NOTE Confidence: 0.83654696

 $00{:}24{:}33.016 \dashrightarrow 00{:}24{:}34.703$  in response to stressful situations.

NOTE Confidence: 0.83654696

00:24:34.703 --> 00:24:36.629 Surrogate period monkeys actually turn out.

NOTE Confidence: 0.83654696

 $00{:}24{:}36{.}630 \dashrightarrow 00{:}24{:}38{.}970$  Developmentally to be much closer

NOTE Confidence: 0.83654696

 $00{:}24{:}38{.}970 \dashrightarrow 00{:}24{:}40{.}842$  to Mother period monkeys,

NOTE Confidence: 0.83654696

 $00{:}24{:}40.850 \dashrightarrow 00{:}24{:}43.552$  but they are still different and so

NOTE Confidence: 0.83654696

 $00{:}24{:}43.552 \dashrightarrow 00{:}24{:}45.323$  these protocols are substantially

NOTE Confidence: 0.83654696

 $00{:}24{:}45{.}323 \dashrightarrow 00{:}24{:}47{.}993$  improved over harlows methods because

 $00:24:47.993 \rightarrow 00:24:51.148$  in addition to providing early social

NOTE Confidence: 0.83654696

 $00{:}24{:}51{.}148 \dashrightarrow 00{:}24{:}53{.}508$  experience to the nursery monkeys,

NOTE Confidence: 0.83654696

 $00:24:53.510 \longrightarrow 00:24:55.066$  which parlors did not?

NOTE Confidence: 0.83654696

 $00:24:55.066 \rightarrow 00:24:57.400$  These monkeys were involved in numerous

NOTE Confidence: 0.83654696

 $00{:}24{:}57{.}467 \dashrightarrow 00{:}25{:}00{.}222$  experiences that both tested their

NOTE Confidence: 0.83654696

00:25:00.222 --> 00:25:02.426 cognitive development emotional development,

NOTE Confidence: 0.83654696

 $00{:}25{:}02{.}430 \dashrightarrow 00{:}25{:}04{.}770$  so they had every day multiple

NOTE Confidence: 0.83654696

00:25:04.770 --> 00:25:06.174 variable rich experiences,

NOTE Confidence: 0.83654696

 $00:25:06.180 \longrightarrow 00:25:09.284$  not only with researchers.

NOTE Confidence: 0.83654696

 $00:25:09.284 \rightarrow 00:25:10.836$  But stimulating?

NOTE Confidence: 0.83654696

 $00{:}25{:}10.840 \dashrightarrow 00{:}25{:}13.888$  Sort of test sessions that would

NOTE Confidence: 0.83654696

 $00{:}25{:}13.888 \dashrightarrow 00{:}25{:}15.920$  stimulate their simulate their

NOTE Confidence: 0.83654696

00:25:16.009 --> 00:25:19.339 brains and also had continually

NOTE Confidence: 0.83654696

 $00{:}25{:}19{.}339 \dashrightarrow 00{:}25{:}21{.}337$  rotating environmental enrichment.

NOTE Confidence: 0.83654696

00:25:21.340 --> 00:25:21.672 Now,

NOTE Confidence: 0.83654696

 $00:25:21.672 \rightarrow 00:25:24.660$  after the first eight to 10 months of life,

- NOTE Confidence: 0.83654696
- $00:25:24.660 \rightarrow 00:25:26.454$  these monkeys would then be reared

 $00{:}25{:}26{.}454 \dashrightarrow 00{:}25{:}28{.}640$  identically in the same housing situation,

NOTE Confidence: 0.83654696

 $00:25:28.640 \longrightarrow 00:25:29.555$  therefore mimic well.

NOTE Confidence: 0.83654696

 $00:25:29.555 \longrightarrow 00:25:31.385$  We would form them into a

NOTE Confidence: 0.83654696

 $00:25:31.385 \rightarrow 00:25:32.959$  mixed social rearing group.

NOTE Confidence: 0.83654696

 $00:25:32.960 \longrightarrow 00:25:34.952$  Now this was a really stressful

NOTE Confidence: 0.83654696

 $00:25:34.952 \longrightarrow 00:25:35.616$  event actually,

NOTE Confidence: 0.83654696

 $00:25:35.620 \longrightarrow 00:25:37.240$  because what would happen

NOTE Confidence: 0.83654696

 $00:25:37.240 \longrightarrow 00:25:38.860$  is literally one day.

NOTE Confidence: 0.83654696

 $00:25:38.860 \longrightarrow 00:25:39.661$  All the monkeys,

NOTE Confidence: 0.83654696

00:25:39.661 --> 00:25:40.729 mother period and nurtured

NOTE Confidence: 0.83654696

 $00{:}25{:}40.729 \dashrightarrow 00{:}25{:}42.260$  would be up and relocated,

NOTE Confidence: 0.83654696

00:25:42.260 --> 00:25:44.516 put into a new room and said OK,

NOTE Confidence: 0.83654696

 $00{:}25{:}44{.}520 \dashrightarrow 00{:}25{:}46{.}864$  Now you have to get along an imagine

NOTE Confidence: 0.83654696

 $00{:}25{:}46{.}864 \dashrightarrow 00{:}25{:}48{.}883$  that you're suddenly one day taken to NOTE Confidence: 0.83654696

 $00{:}25{:}48.883 \dashrightarrow 00{:}25{:}51.127$  a new home with new people and you

NOTE Confidence: 0.83654696

 $00:25:51.127 \longrightarrow 00:25:54.680$  just have to learn how to get along.

NOTE Confidence: 0.83654696

 $00:25:54.680 \rightarrow 00:25:56.612$  So although this was a majorly

NOTE Confidence: 0.83654696

 $00:25:56.612 \rightarrow 00:25:57.256$  stressful experience,

NOTE Confidence: 0.83654696

 $00{:}25{:}57{.}260 \dashrightarrow 00{:}25{:}58{.}870$  it was not permanently stressful.

NOTE Confidence: 0.83654696

00:25:58.870 --> 00:26:01.117 They did adapt as you'll see later,

NOTE Confidence: 0.83654696

 $00:26:01.120 \longrightarrow 00:26:02.975$  but it's important to note that they

NOTE Confidence: 0.83654696

 $00:26:02.975 \rightarrow 00:26:04.988$  live in this mixture ING environment

NOTE Confidence: 0.83654696

 $00:26:04.988 \longrightarrow 00:26:06.918$  with identical care in treatment,

NOTE Confidence: 0.83654696

 $00:26:06.920 \rightarrow 00:26:09.167$  essentially for the rest of their lives.

NOTE Confidence: 0.83654696

00:26:09.170 --> 00:26:09.491 Now,

NOTE Confidence: 0.83654696

 $00:26:09.491 \longrightarrow 00:26:11.096$  at three years of age,

NOTE Confidence: 0.83654696

00:26:11.100 --> 00:26:13.636 and we separated them by  $^{\ast\ast\ast}$  to avoid

NOTE Confidence: 0.83654696

00:26:13.636 --> 00:26:14.848 unintended pregnancies and females

NOTE Confidence: 0.83654696

 $00:26:14.848 \rightarrow 00:26:16.900$  went back into the breeding colony,

NOTE Confidence: 0.83654696

 $00:26:16.900 \rightarrow 00:26:18.505$  but they still maintain their

- NOTE Confidence: 0.83654696
- 00:26:18.505 --> 00:26:19.468 mixed rearing groups,
- NOTE Confidence: 0.83654696
- $00{:}26{:}19{.}470 \dashrightarrow 00{:}26{:}21{.}612$  and so any differences that we
- NOTE Confidence: 0.83654696
- $00{:}26{:}21.612 \dashrightarrow 00{:}26{:}24.079$  observed after the first eight to 10
- NOTE Confidence: 0.83654696
- $00:26:24.079 \dashrightarrow 00:26:26.023$  months of life can be attributed.
- NOTE Confidence: 0.83654696
- $00:26:26.030 \longrightarrow 00:26:27.414$  To the differential early
- NOTE Confidence: 0.83654696
- $00:26:27.414 \longrightarrow 00:26:29.144$  rearing experiences in the first
- NOTE Confidence: 0.83654696
- $00:26:29.144 \longrightarrow 00:26:30.680$  eight to 10 months of life.
- NOTE Confidence: 0.8536526
- 00:26:33.700 -> 00:26:35.680 Now over the last several years,
- NOTE Confidence: 0.8536526
- $00:26:35.680 \longrightarrow 00:26:37.990$  we've been able to look at how
- NOTE Confidence: 0.8536526
- 00:26:37.990 --> 00:26:39.310 these different, tightly controlled,
- NOTE Confidence: 0.8536526
- $00:26:39.310 \longrightarrow 00:26:40.300$  early life experiences
- NOTE Confidence: 0.8536526
- $00{:}26{:}40{.}300 \dashrightarrow 00{:}26{:}41{.}290$  influence multiple outcomes.
- NOTE Confidence: 0.8536526
- 00:26:41.290 --> 00:26:43.341 In one of our primary outcomes of
- NOTE Confidence: 0.8536526
- $00{:}26{:}43{.}341 \dashrightarrow 00{:}26{:}44{.}920$  interest is cognitive development,
- NOTE Confidence: 0.8536526
- $00{:}26{:}44{.}920 \dashrightarrow 00{:}26{:}46{.}906$  which we assess in monkeys from
- NOTE Confidence: 0.8536526

00:26:46.906 --> 00:26:49.209 about four to eight months of age,

NOTE Confidence: 0.8536526

 $00{:}26{:}49{.}210 \dashrightarrow 00{:}26{:}50{.}805$  which is equivalent to approximately

NOTE Confidence: 0.8536526

00:26:50.805 - 00:26:52.840 one to three years in humans,

NOTE Confidence: 0.8536526

 $00{:}26{:}52{.}840 \dashrightarrow 00{:}26{:}54{.}682$  and there's a direct through line

NOTE Confidence: 0.8536526

 $00:26:54.682 \longrightarrow 00:26:56.673$  from Harlow's very early work on

NOTE Confidence: 0.8536526

 $00:26:56.673 \rightarrow 00:26:58.448$  cognitive capabilities to our research.

NOTE Confidence: 0.8536526

 $00{:}26{:}58{.}450 \dashrightarrow 00{:}27{:}00{.}430$  If you remember when I mentioned

NOTE Confidence: 0.8536526

00:27:00.430 --> 00:27:01.750 earlier the W GTA,

NOTE Confidence: 0.8536526

 $00{:}27{:}01{.}750 \dashrightarrow 00{:}27{:}04{.}156$  there was constant general testing apparatus.

NOTE Confidence: 0.8536526

 $00:27:04.160 \longrightarrow 00:27:06.152$  We use that in the early work and

NOTE Confidence: 0.8536526

 $00{:}27{:}06.152 \dashrightarrow 00{:}27{:}07{.}934$  along with standardized battery of

NOTE Confidence: 0.8536526

 $00:27:07.934 \rightarrow 00:27:09.974$  cognitive assessments that were developed

NOTE Confidence: 0.8536526

 $00{:}27{:}09{.}974 \dashrightarrow 00{:}27{:}12{.}319$  at the primate lab at Washington,

NOTE Confidence: 0.8536526

 $00:27:12.320 \longrightarrow 00:27:14.384$  where I was an undergrad in

NOTE Confidence: 0.8536526

00:27:14.384 --> 00:27:16.060 which I was trained on.

NOTE Confidence: 0.8536526

00:27:16.060 --> 00:27:17.908 But up until very recently it was

- NOTE Confidence: 0.8536526
- $00:27:17.908 \rightarrow 00:27:19.515$  only possible to administer these

 $00:27:19.515 \rightarrow 00:27:21.035$  cognitive assessments to nursery

NOTE Confidence: 0.8536526

 $00{:}27{:}21.035 \dashrightarrow 00{:}27{:}23.341$  monkeys because of the compounds that

NOTE Confidence: 0.8536526

 $00:27:23.341 \rightarrow 00:27:25.161$  would come along with separating

NOTE Confidence: 0.8536526

 $00{:}27{:}25.161 \dashrightarrow 00{:}27{:}27.280$  temporarily an infant from its mother

NOTE Confidence: 0.8536526

 $00{:}27{:}27{.}280 \dashrightarrow 00{:}27{:}29{.}320$  to give a cognitive tasks well.

NOTE Confidence: 0.8536526

00:27:29.320 --> 00:27:30.560 A few years ago,

NOTE Confidence: 0.8536526

 $00{:}27{:}30{.}560 \dashrightarrow 00{:}27{:}32{.}833$  we decided to tackle this and we

NOTE Confidence: 0.8536526

 $00{:}27{:}32.833 \dashrightarrow 00{:}27{:}34.891$  devised a method a really simple

NOTE Confidence: 0.8536526

 $00:27:34.891 \rightarrow 00:27:37.480$  apparatus to be able to test socially.

NOTE Confidence: 0.8536526

 $00:27:37.480 \longrightarrow 00:27:38.832$  House Mother period infants.

NOTE Confidence: 0.8536526

00:27:38.832 --> 00:27:40.184 Here on the left,

NOTE Confidence: 0.8536526

 $00{:}27{:}40.190 \dashrightarrow 00{:}27{:}41.930$  in their home environments and to

NOTE Confidence: 0.8536526

 $00{:}27{:}41{.}930 \dashrightarrow 00{:}27{:}43{.}464$  compare them directly with nursery

NOTE Confidence: 0.8536526

 $00:27:43.464 \rightarrow 00:27:45.704$  reared in infants in their home environments.

 $00:27:45.710 \longrightarrow 00:27:47.719$  So we had no need for separating

NOTE Confidence: 0.8536526

 $00:27:47.719 \longrightarrow 00:27:49.090$  infants from their mothers.

NOTE Confidence: 0.8536526

 $00{:}27{:}49.090 \dashrightarrow 00{:}27{:}51.112$  We got no distress responses and

NOTE Confidence: 0.8536526

 $00:27:51.112 \rightarrow 00:27:53.314$  we weren't moving them to a novel

NOTE Confidence: 0.8536526

 $00{:}27{:}53{.}314 \dashrightarrow 00{:}27{:}54{.}619$  room to do the testing.

NOTE Confidence: 0.8536526

 $00{:}27{:}54.620 \dashrightarrow 00{:}27{:}57.490$  As you saw in this last picture.

NOTE Confidence: 0.8536526

 $00:27:57.490 \longrightarrow 00:27:59.282$  And I'm going to show a video of

NOTE Confidence: 0.8536526

 $00:27:59.282 \rightarrow 00:28:01.263$  what this simple yet I I feel

NOTE Confidence: 0.8536526

 $00{:}28{:}01{.}263 \dashrightarrow 00{:}28{:}02{.}447$  elegant apparatus looked like.

NOTE Confidence: 0.8536526

 $00{:}28{:}02{.}450 \dashrightarrow 00{:}28{:}04{.}088$  So it was a cage within the

NOTE Confidence: 0.8536526

 $00:28:04.088 \longrightarrow 00:28:05.579$  large floor to ceiling cage,

NOTE Confidence: 0.8536526

 $00:28:05.580 \longrightarrow 00:28:07.295$  and this cage had a tiny little

NOTE Confidence: 0.8536526

 $00:28:07.295 \rightarrow 00:28:09.085$  tunnel that only the infant was small

NOTE Confidence: 0.8536526

 $00:28:09.085 \rightarrow 00:28:11.203$  enough to fit through so mom could not

NOTE Confidence: 0.8536526

 $00{:}28{:}11{.}203 \dashrightarrow 00{:}28{:}12{.}889$  prohibit her infant from going in.

NOTE Confidence: 0.8536526

 $00:28:12.890 \longrightarrow 00:28:14.456$  And I'm here to tell you.

- NOTE Confidence: 0.8536526
- $00:28:14.460 \longrightarrow 00:28:16.280$  As you can see from the video,

 $00:28:16.280 \longrightarrow 00:28:17.690$  once the babies learned that they

NOTE Confidence: 0.8536526

 $00{:}28{:}17.690 \dashrightarrow 00{:}28{:}19.274$  could go in and access streets

NOTE Confidence: 0.8536526

 $00:28:19.274 \longrightarrow 00:28:20.458$  that mom couldn't get,

NOTE Confidence: 0.8536526

 $00{:}28{:}20{.}460 \dashrightarrow 00{:}28{:}22{.}287$  they were they were all about it.

NOTE Confidence: 0.8536526

 $00{:}28{:}22{.}290 \dashrightarrow 00{:}28{:}24{.}090$  And so you can see this one waiting

NOTE Confidence: 0.8536526

 $00{:}28{:}24.090 \dashrightarrow 00{:}28{:}25.995$  and as soon as the occluder concern

NOTE Confidence: 0.8536526

 $00:28:25.995 \longrightarrow 00:28:27.770$  comes in and grabs that treat.

NOTE Confidence: 0.83347994

 $00{:}28{:}32.060 \dashrightarrow 00{:}28{:}33.957$  So here are some of the tasks

NOTE Confidence: 0.83347994

 $00:28:33.957 \longrightarrow 00:28:35.619$  that we gave her infants.

NOTE Confidence: 0.83347994

 $00{:}28{:}35{.}620 \dashrightarrow 00{:}28{:}37{.}580$  We gave them a simple training tasks

NOTE Confidence: 0.83347994

 $00{:}28{:}37{.}580 \dashrightarrow 00{:}28{:}39{.}415$  such as simple training tasks that

NOTE Confidence: 0.83347994

 $00{:}28{:}39{.}415 \dashrightarrow 00{:}28{:}41{.}606$  simply where they learn to push as ide

NOTE Confidence: 0.83347994

 $00{:}28{:}41.662 \dashrightarrow 00{:}28{:}43.636$  an object to retrieve a food reward.

NOTE Confidence: 0.83347994

 $00:28:43.640 \longrightarrow 00:28:44.828$  We followed that with

 $00:28:44.828 \longrightarrow 00:28:45.719$  the discrimination task,

NOTE Confidence: 0.83347994

 $00{:}28{:}45{.}720 \dashrightarrow 00{:}28{:}47{.}666$  which was a measure of their ability

NOTE Confidence: 0.83347994

 $00:28:47.666 \rightarrow 00:28:49.578$  to associate an object with reward,

NOTE Confidence: 0.83347994

 $00:28:49.580 \rightarrow 00:28:51.589$  and so the object that was rewarded

NOTE Confidence: 0.83347994

 $00{:}28{:}51{.}589 \dashrightarrow 00{:}28{:}54{.}234$  would either be a black block or a white

NOTE Confidence: 0.83347994

 $00:28:54.234 \rightarrow 00:28:56.119$  block randomly assigned to each infant,

NOTE Confidence: 0.83347994

 $00:28:56.120 \longrightarrow 00:28:57.380$  and the presentation of

NOTE Confidence: 0.83347994

 $00{:}28{:}57{.}380 \dashrightarrow 00{:}28{:}58{.}640$  those blocks would be.

NOTE Confidence: 0.83347994

 $00{:}28{:}58{.}640 \dashrightarrow 00{:}29{:}00{.}316$  Randomly switched side to

NOTE Confidence: 0.83347994

 $00:29:00.316 \longrightarrow 00:29:02.830$  side across 25 trials per day.

NOTE Confidence: 0.83347994

 $00:29:02.830 \longrightarrow 00:29:04.310$  Once they pass that test,

NOTE Confidence: 0.83347994

 $00{:}29{:}04{.}310 \dashrightarrow 00{:}29{:}06{.}144$  we gave them a reversal task to

NOTE Confidence: 0.83347994

 $00:29:06.144 \rightarrow 00:29:07.550$  measure their cognitive flexibility.

NOTE Confidence: 0.83347994

00:29:07.550 --> 00:29:09.320 So if Black was previously rewarded,

NOTE Confidence: 0.83347994

 $00{:}29{:}09{.}320 \dashrightarrow 00{:}29{:}11{.}000$  we then rewarded the white block

NOTE Confidence: 0.83347994

00:29:11.000 - 00:29:13.394 and look to see how long it took

 $00:29:13.394 \rightarrow 00:29:15.212$  them to learn this new Association,

NOTE Confidence: 0.83347994

00:29:15.220 --> 00:29:17.474 and then finally they don't have time

NOTE Confidence: 0.83347994

 $00{:}29{:}17{.}474 \dashrightarrow 00{:}29{:}20{.}112$  to go into the details that video you

NOTE Confidence: 0.83347994

 $00{:}29{:}20{.}112 \dashrightarrow 00{:}29{:}23{.}023$  saw in the last slide was really a

NOTE Confidence: 0.83347994

 $00:29:23.023 \rightarrow 00:29:25.073$  task to measure infants impulsivity.

NOTE Confidence: 0.83347994

 $00:29:25.080 \longrightarrow 00:29:27.696$  And so, in our study of Mother P.

NOTE Confidence: 0.83347994

00:29:27.700 --> 00:29:28.846 Reardon nursery monkeys,

NOTE Confidence: 0.83347994

 $00:29:28.846 \longrightarrow 00:29:30.756$  we found no global cognitive

NOTE Confidence: 0.83347994

 $00{:}29{:}30.756 \dashrightarrow 00{:}29{:}32.382$  differences when we looked at

NOTE Confidence: 0.83347994

00:29:32.382 --> 00:29:34.251 cognition in the first year of life,

NOTE Confidence: 0.83347994

00:29:34.260 --> 00:29:36.556 and in fact on 19 different measures,

NOTE Confidence: 0.83347994

 $00{:}29{:}36{.}560 \dashrightarrow 00{:}29{:}37{.}868$  we actually found significant

NOTE Confidence: 0.83347994

00:29:37.868 --> 00:29:40.170 ring effects only for two of them,

NOTE Confidence: 0.83347994

 $00:29:40.170 \longrightarrow 00:29:42.466$  and one of them actually was on

NOTE Confidence: 0.83347994

 $00:29:42.466 \longrightarrow 00:29:43.450$  this training task,

 $00:29:43.450 \longrightarrow 00:29:46.498$  which does not really.

NOTE Confidence: 0.83347994

 $00:29:46.500 \longrightarrow 00:29:48.044$  Impact the cognitive development

NOTE Confidence: 0.83347994

 $00{:}29{:}48.044 \dashrightarrow 00{:}29{:}50.360$  or what we know about cognitive

NOTE Confidence: 0.83347994

 $00:29:50.430 \longrightarrow 00:29:51.818$  development as a whole.

NOTE Confidence: 0.83347994

 $00{:}29{:}51{.}820 \dashrightarrow 00{:}29{:}54{.}292$  And so this is just one example of

NOTE Confidence: 0.83347994

 $00:29:54.292 \rightarrow 00:29:56.817$  data showing the performance on the

NOTE Confidence: 0.83347994

 $00{:}29{:}56{.}817 \dashrightarrow 00{:}29{:}58{.}657$  discrimination and reversal test.

NOTE Confidence: 0.83347994

 $00{:}29{:}58.660 \dashrightarrow 00{:}30{:}00{.}208$  Those black white tan.

NOTE Confidence: 0.83347994

 $00{:}30{:}00{.}208 \dashrightarrow 00{:}30{:}01{.}756$  Now in this figure,

NOTE Confidence: 0.83347994

 $00{:}30{:}01{.}760 \dashrightarrow 00{:}30{:}03{.}824$  Mother Pier and monkeys are always

NOTE Confidence: 0.83347994

 $00:30:03.824 \dashrightarrow 00:30:06.309$  presented on the left of the blue line.

NOTE Confidence: 0.83347994

00:30:06.310 --> 00:30:07.630 Here nursery rhyme monkeys,

NOTE Confidence: 0.83347994

 $00:30:07.630 \dashrightarrow 00:30:09.610$  which is both period answer again

NOTE Confidence: 0.83347994

 $00:30:09.672 \longrightarrow 00:30:11.187$  because they did not differ.

NOTE Confidence: 0.83347994

00:30:11.190 - 00:30:12.775 They're always presented on the

NOTE Confidence: 0.83347994

 $00:30:12.775 \rightarrow 00:30:15.291$  right side of the blue line and what

- NOTE Confidence: 0.83347994
- $00:30:15.291 \rightarrow 00:30:17.307$  you're looking at is that there are
- NOTE Confidence: 0.83347994
- $00{:}30{:}17{.}370 \dashrightarrow 00{:}30{:}19{.}960$  no rearing differences in monkeys bulk rate.
- NOTE Confidence: 0.83347994
- $00:30:19.960 \dashrightarrow 00:30:22.006$  That's their refusal to work and
- NOTE Confidence: 0.83347994
- $00:30:22.006 \longrightarrow 00:30:24.666$  how many days it took them to pass
- NOTE Confidence: 0.83347994
- $00{:}30{:}24.666 \dashrightarrow 00{:}30{:}27.202$  the test and how long they took per
- NOTE Confidence: 0.83347994
- $00{:}30{:}27{.}202 \dashrightarrow 00{:}30{:}29{.}393$  trial to conduct the tasks or in
- NOTE Confidence: 0.83347994
- $00:30:29.393 \rightarrow 00:30:32.018$  the percentage of trials correct.
- NOTE Confidence: 0.83347994
- $00{:}30{:}32{.}020 \dashrightarrow 00{:}30{:}34{.}015$  And we checked this lack of differences
- NOTE Confidence: 0.83347994
- $00{:}30{:}34.015 \dashrightarrow 00{:}30{:}36.453$  up to the fact that all infants
- NOTE Confidence: 0.83347994
- $00:30:36.453 \dashrightarrow 00:30:38.348$  were very carefully acclimatized to
- NOTE Confidence: 0.83347994
- $00:30:38.348 \dashrightarrow 00:30:40.767$  testing procedures and to the researchers,
- NOTE Confidence: 0.83347994
- $00{:}30{:}40.770 \dashrightarrow 00{:}30{:}42.520$  and especially that they were
- NOTE Confidence: 0.83347994
- $00{:}30{:}42.520 \dashrightarrow 00{:}30{:}44.270$  comfortable in their home environments.
- NOTE Confidence: 0.83347994
- $00:30:44.270 \longrightarrow 00:30:44.932$  And importantly,
- NOTE Confidence: 0.83347994
- $00{:}30{:}44{.}932 \dashrightarrow 00{:}30{:}46{.}587$  we didn't test cognitive capacities
- NOTE Confidence: 0.83347994

00:30:46.587 --> 00:30:48.120 under mildly stressful situations,

NOTE Confidence: 0.83347994

 $00:30:48.120 \longrightarrow 00:30:50.304$  but obviously we might expect that we

NOTE Confidence: 0.83347994

 $00:30:50.304 \rightarrow 00:30:52.320$  would see rearing differences there,

NOTE Confidence: 0.83347994

 $00:30:52.320 \longrightarrow 00:30:54.784$  and we also have not yet been able

NOTE Confidence: 0.83347994

 $00:30:54.784 \rightarrow 00:30:56.948$  to look for differences in learning

NOTE Confidence: 0.83347994

 $00{:}30{:}56{.}948 \dashrightarrow 00{:}30{:}59{.}670$  day by day or trial by trial.

NOTE Confidence: 0.83347994

00:30:59.670 --> 00:31:01.896 This is just a gross overview

NOTE Confidence: 0.83347994

00:31:01.896 --> 00:31:03.009 of cognitive development.

NOTE Confidence: 0.83347994

 $00{:}31{:}03{.}010 \dashrightarrow 00{:}31{:}05{.}248$  But looking in that finer detail

NOTE Confidence: 0.83347994

 $00{:}31{:}05{.}248 \dashrightarrow 00{:}31{:}07{.}699$  is something I hope to do when

NOTE Confidence: 0.83347994

 $00{:}31{:}07.699 \dashrightarrow 00{:}31{:}09.469$  I have a little more time.

NOTE Confidence: 0.83347994

 $00:31:09.470 \longrightarrow 00:31:11.155$  So with techniques that have

NOTE Confidence: 0.83347994

00:31:11.155 - 00:31:12.503 emerged in recent years,

NOTE Confidence: 0.83347994

 $00:31:12.510 \longrightarrow 00:31:14.694$  we've also been able to start probing

NOTE Confidence: 0.83347994

 $00{:}31{:}14.694 \dashrightarrow 00{:}31{:}16.770$  how early life experiences get under

NOTE Confidence: 0.83347994

 $00:31:16.770 \longrightarrow 00:31:18.930$  the skin to affect later health,

- NOTE Confidence: 0.83347994
- $00:31:18.930 \longrightarrow 00:31:20.688$  and one of the ways we've

 $00:31:20.688 \longrightarrow 00:31:21.860$  looked under the skin

NOTE Confidence: 0.85018224

 $00:31:21.922 \longrightarrow 00:31:23.938$  is by developing an assay to

NOTE Confidence: 0.85018224

 $00:31:23.938 \rightarrow 00:31:25.745$  measure chronic stress by measuring

NOTE Confidence: 0.85018224

 $00{:}31{:}25.745 \dashrightarrow 00{:}31{:}27.715$  the hormone cortisol in her.

NOTE Confidence: 0.85018224

 $00:31:27.720 \longrightarrow 00:31:29.800$  Now, cortisol travels through the

NOTE Confidence: 0.85018224

 $00{:}31{:}29{.}800 \dashrightarrow 00{:}31{:}31{.}880$  bloodstream and is deposited into

NOTE Confidence: 0.85018224

 $00{:}31{:}31{.}950 \dashrightarrow 00{:}31{:}33{.}595$  the hair shaft and accumulates

NOTE Confidence: 0.85018224

 $00{:}31{:}33{.}595 \dashrightarrow 00{:}31{:}36{.}074$  over time so that when you take a

NOTE Confidence: 0.85018224

 $00:31:36.074 \rightarrow 00:31:38.228$  sample here at the base of the skin,

NOTE Confidence: 0.85018224

 $00:31:38.228 \longrightarrow 00:31:40.436$  the base close to the skin.

NOTE Confidence: 0.85018224

 $00{:}31{:}40{.}440 \dashrightarrow 00{:}31{:}43{.}158$  Surface, I mean the amount of

NOTE Confidence: 0.85018224

 $00:31:43.158 \longrightarrow 00:31:46.274$  cortisol that you get is an

NOTE Confidence: 0.85018224

 $00{:}31{:}46{.}274 \dashrightarrow 00{:}31{:}48{.}086$  aggregate representation of.

NOTE Confidence: 0.85018224

 $00{:}31{:}48.090 \dashrightarrow 00{:}31{:}49.824$  Hypothalamic pituitary adrenal

 $00:31:49.824 \longrightarrow 00:31:52.714$  axis activity is basically a

NOTE Confidence: 0.85018224

 $00:31:52.714 \rightarrow 00:31:55.568$  phenotypic view of cortisol activity.

NOTE Confidence: 0.85018224

 $00:31:55.570 \longrightarrow 00:31:57.622$  And to measure cortisol we simply

NOTE Confidence: 0.85018224

00:31:57.622 --> 00:32:00.140 shave patches of hair from the backs

NOTE Confidence: 0.85018224

 $00{:}32{:}00{.}140 \dashrightarrow 00{:}32{:}02{.}300$  of monkeys neck at routine intervals.

NOTE Confidence: 0.85018224

 $00{:}32{:}02{.}300 \dashrightarrow 00{:}32{:}04.065$  And since this procedure was

NOTE Confidence: 0.85018224

00:32:04.065 --> 00:32:05.124 developed in monkeys,

NOTE Confidence: 0.85018224

 $00:32:05.130 \rightarrow 00:32:07.954$  it's since been adapted for use in humans.

NOTE Confidence: 0.85018224

 $00{:}32{:}07{.}960 \dashrightarrow 00{:}32{:}10{.}438$  Where no, we don't shave large patches,

NOTE Confidence: 0.85018224

 $00:32:10.440 \rightarrow 00:32:13.058$  but we get very small samples with

NOTE Confidence: 0.85018224

 $00{:}32{:}13.058 \dashrightarrow 00{:}32{:}15.337$  scissors and process the samples

NOTE Confidence: 0.85018224

 $00{:}32{:}15{.}337 \dashrightarrow 00{:}32{:}16{.}969$  for cortisol concentrations.

NOTE Confidence: 0.85018224

00:32:16.970 --> 00:32:19.308 Now, if you were in our study

NOTE Confidence: 0.85018224

00:32:19.308 --> 00:32:20.900 of differently reared monkeys,

NOTE Confidence: 0.85018224

 $00{:}32{:}20{.}900 \dashrightarrow 00{:}32{:}22{.}850$  we looked at her cortisol

NOTE Confidence: 0.85018224

 $00:32:22.850 \rightarrow 00:32:24.020$  concentrations across development

 $00:32:24.020 \rightarrow 00:32:26.247$  from birth through two years of age.

NOTE Confidence: 0.85018224

 $00:32:26.250 \dashrightarrow 00:32:27.725$  Now remember any differences we

NOTE Confidence: 0.85018224

 $00{:}32{:}27{.}725 \dashrightarrow 00{:}32{:}30{.}390$  see after 8 to 10 months should be

NOTE Confidence: 0.85018224

00:32:30.390 --> 00:32:32.634 attributable to the first months of

NOTE Confidence: 0.85018224

 $00:32:32.634 \dashrightarrow 00:32:34.458$  different early life experiences,

NOTE Confidence: 0.85018224

 $00{:}32{:}34{.}460 \dashrightarrow 00{:}32{:}36{.}836$  and this figure is showing you

NOTE Confidence: 0.85018224

 $00{:}32{:}36{.}836 \dashrightarrow 00{:}32{:}38{.}420$  her cortisol concentrations for

NOTE Confidence: 0.85018224

 $00:32:38.483 \longrightarrow 00:32:40.079$  all three rearing groups.

NOTE Confidence: 0.85018224

 $00{:}32{:}40{.}080 \dashrightarrow 00{:}32{:}42{.}270$  The blue line indicates that stressful

NOTE Confidence: 0.85018224

 $00{:}32{:}42.270 \dashrightarrow 00{:}32{:}44.277$  relocation that I mentioned and 1st

NOTE Confidence: 0.85018224

 $00{:}32{:}44.277 \dashrightarrow 00{:}32{:}46.221$  I want to draw your attention to the

NOTE Confidence: 0.85018224

 $00{:}32{:}46{.}284 \dashrightarrow 00{:}32{:}48{.}312$  fact that prior to relocation those

NOTE Confidence: 0.85018224

 $00{:}32{:}48{.}312 \dashrightarrow 00{:}32{:}50{.}167$  peer weird monkeys, the black squares.

NOTE Confidence: 0.85018224

 $00{:}32{:}50{.}167 \dashrightarrow 00{:}32{:}52{.}840$  The ones I said to develop hyper attachments.

NOTE Confidence: 0.85018224

 $00:32:52.840 \longrightarrow 00:32:54.545$  Those monkeys had higher her

 $00{:}32{:}54{.}545 \dashrightarrow 00{:}32{:}55{.}909$  cortisol concentrations than either

NOTE Confidence: 0.85018224

00:32:55.909 - 00:32:57.940 of the other two groups of monkeys,

NOTE Confidence: 0.85018224

 $00:32:57.940 \longrightarrow 00:32:59.455$  just at baseline.

NOTE Confidence: 0.85018224

 $00{:}32{:}59{.}455 \dashrightarrow 00{:}33{:}01{.}980$  And these her cortisol concentrations

NOTE Confidence: 0.85018224

 $00{:}33{:}01{.}980 \dashrightarrow 00{:}33{:}04{.}373$  remained elevated for up to a

NOTE Confidence: 0.85018224

 $00{:}33{:}04{.}373 \dashrightarrow 00{:}33{:}05{.}685$  year after the relocation.

NOTE Confidence: 0.85018224

00:33:05.690 --> 00:33:07.555 Surrogate monkeys showed a massive

NOTE Confidence: 0.85018224

 $00:33:07.555 \rightarrow 00:33:10.110$  increase in her cortisol after relocation,

NOTE Confidence: 0.85018224

 $00{:}33{:}10{.}110 \dashrightarrow 00{:}33{:}11{.}718$  which also stayed elevated.

NOTE Confidence: 0.85018224

00:33:11.718 --> 00:33:14.991 But importantly by two years of age after

NOTE Confidence: 0.85018224

 $00{:}33{:}14.991 \dashrightarrow 00{:}33{:}17.749$  they had had sufficient time to acclimate,

NOTE Confidence: 0.85018224

 $00:33:17.750 \rightarrow 00:33:20.286$  the monkeys were indistinguishable

NOTE Confidence: 0.85018224

 $00:33:20.286 \longrightarrow 00:33:22.188$  from one another.

NOTE Confidence: 0.85018224

 $00:33:22.190 \longrightarrow 00:33:24.500$  Now when we looked at these

NOTE Confidence: 0.85018224

 $00:33:24.500 \dashrightarrow 00:33:26.040$  same monkeys anxious behavior,

NOTE Confidence: 0.85018224

 $00:33:26.040 \rightarrow 00:33:27.970$  we found somewhat similar patterns.

- NOTE Confidence: 0.85018224
- 00:33:27.970 --> 00:33:29.968 The monkeys did not develop any

00:33:29.968 --> 00:33:32.264 anxious or show very much anxious

NOTE Confidence: 0.85018224

 $00:33:32.264 \rightarrow 00:33:34.504$  behavior in their home environments.

NOTE Confidence: 0.85018224

 $00:33:34.510 \longrightarrow 00:33:35.290$  Preload relocation,

NOTE Confidence: 0.85018224

 $00{:}33{:}35{.}290 \dashrightarrow 00{:}33{:}36{.}850$  but understandably all monkeys

NOTE Confidence: 0.85018224

 $00:33:36.850 \dashrightarrow 00:33:39.518$  found this to be a stressful event.

NOTE Confidence: 0.85018224

 $00:33:39.520 \rightarrow 00:33:41.830$  An showed massive increases in anxiety,

NOTE Confidence: 0.85018224

 $00:33:41.830 \rightarrow 00:33:44.140$  especially if they were nursery reared,

NOTE Confidence: 0.85018224

 $00:33:44.140 \longrightarrow 00:33:46.060$  but particularly for period monkeys.

NOTE Confidence: 0.85018224

00:33:46.060 --> 00:33:46.512 Again,

NOTE Confidence: 0.85018224

 $00{:}33{:}46{.}512 \dashrightarrow 00{:}33{:}49{.}224$  the squares here those levels of

NOTE Confidence: 0.85018224

 $00{:}33{:}49{.}224 \dashrightarrow 00{:}33{:}51{.}041$  anxious behavior remained elevated

NOTE Confidence: 0.85018224

 $00:33:51.041 \rightarrow 00:33:53.778$  for up to one year after relocation.

NOTE Confidence: 0.85018224

 $00:33:53.780 \longrightarrow 00:33:55.928$  However, by two years of age,

NOTE Confidence: 0.85018224

 $00:33:55.930 \longrightarrow 00:33:56.290$  again,

 $00:33:56.290 \rightarrow 00:33:58.450$  they were indistinguishable from one another.

NOTE Confidence: 0.85018224

 $00{:}33{:}58{.}450 \dashrightarrow 00{:}34{:}00{.}270$  Now we wanted to know does does

NOTE Confidence: 0.85018224

 $00:34:00.270 \longrightarrow 00:34:02.374$  her cortisol in infancy before the

NOTE Confidence: 0.85018224

 $00{:}34{:}02{.}374 \dashrightarrow 00{:}34{:}04{.}058$  relocation predict anxious behavior

NOTE Confidence: 0.85018224

 $00{:}34{:}04.058 \dashrightarrow 00{:}34{:}05.990$  after their stressful relocation?

NOTE Confidence: 0.85018224

 $00:34:05.990 \longrightarrow 00:34:07.780$  And the answer is yes,

NOTE Confidence: 0.85018224

 $00{:}34{:}07{.}780 \dashrightarrow 00{:}34{:}09{.}570$  we found a significant correlation

NOTE Confidence: 0.85018224

 $00:34:09.570 \longrightarrow 00:34:10.644$  for all monkeys.

NOTE Confidence: 0.85018224

 $00:34:10.650 \dashrightarrow 00:34:14.520$  But when we broke it down by rearing group.

NOTE Confidence: 0.85018224

 $00:34:14.520 \rightarrow 00:34:16.340$  That correlation maybe no surprise,

NOTE Confidence: 0.85018224

 $00:34:16.340 \rightarrow 00:34:18.518$  was significant only for purity animals,

NOTE Confidence: 0.85018224

 $00{:}34{:}18{.}520 \dashrightarrow 00{:}34{:}20{.}340$  an this correlation persistent again,

NOTE Confidence: 0.85018224

 $00:34:20.340 \rightarrow 00:34:22.888$  for up to one year post relocation.

NOTE Confidence: 0.8373482

 $00:34:25.610 \longrightarrow 00:34:27.235$  Another important outcome of interest

NOTE Confidence: 0.8373482

 $00{:}34{:}27{.}235 \dashrightarrow 00{:}34{:}28{.}860$  for us is social rank attainment,

NOTE Confidence: 0.8373482

 $00:34:28.860 \longrightarrow 00:34:31.009$  which in this study I'm about to

- NOTE Confidence: 0.8373482
- $00{:}34{:}31{.}009 \dashrightarrow 00{:}34{:}33{.}000$  present we measured or reassessed in

 $00{:}34{:}33{.}000 \dashrightarrow 00{:}34{:}35{.}352$  adolescent monkeys age 2 to three years,

NOTE Confidence: 0.8373482

 $00:34:35.360 \longrightarrow 00:34:37.394$  which is equivalent to about 8

NOTE Confidence: 0.8373482

 $00:34:37.394 \rightarrow 00:34:39.959$  to 12 years in human children.

NOTE Confidence: 0.8373482

00:34:39.960 --> 00:34:42.207 Now, rhesus monkeys have a very rigid

NOTE Confidence: 0.8373482

00:34:42.207 --> 00:34:43.740 varying linear dominance hierarchy,

NOTE Confidence: 0.8373482

 $00{:}34{:}43.740 \dashrightarrow 00{:}34{:}45.903$  which is enforced by often subtle but

NOTE Confidence: 0.8373482

 $00{:}34{:}45{.}903 \dashrightarrow 00{:}34{:}47{.}869$  sometimes not so subtle behaviors.

NOTE Confidence: 0.8373482

00:34:47.870 --> 00:34:50.582 So sometimes even a sideways glance will be

NOTE Confidence: 0.8373482

 $00:34:50.582 \rightarrow 00:34:53.376$  enough to tell one monkey who's in charge,

NOTE Confidence: 0.8373482

 $00{:}34{:}53{.}380 \dashrightarrow 00{:}34{:}56{.}444$  by the way, notice in the background who's

NOTE Confidence: 0.8373482

 $00{:}34{:}56{.}444 \dashrightarrow 00{:}34{:}58{.}801$  watching this interaction and learning

NOTE Confidence: 0.8373482

 $00:34:58.801 \dashrightarrow 00:35:01.326$  some really important social cues.

NOTE Confidence: 0.8373482

00:35:01.330 --> 00:35:02.930 Other behaviors that reinforce the

NOTE Confidence: 0.8373482

 $00:35:02.930 \rightarrow 00:35:04.530$  dominance hierarchy are threat displays,

 $00{:}35{:}04{.}530 \dashrightarrow 00{:}35{:}07{.}274$  and then if they get a really escalated

NOTE Confidence: 0.8373482

 $00:35:07.274 \rightarrow 00:35:09.320$  monkeys will physically chase and

NOTE Confidence: 0.8373482

 $00:35:09.320 \longrightarrow 00:35:10.607$  attack each other.

NOTE Confidence: 0.8373482

 $00:35:10.610 \rightarrow 00:35:13.570$  Now, the way the hierarchy goes is that

NOTE Confidence: 0.8373482

 $00{:}35{:}13.570 \dashrightarrow 00{:}35{:}16.925$  monkey A will always win against Monkey B,

NOTE Confidence: 0.8373482

 $00{:}35{:}16{.}930 \dashrightarrow 00{:}35{:}21{.}097$  who never loses to anyone except a monkey a.

NOTE Confidence: 0.8373482

00:35:21.100 --> 00:35:23.380 But monkey be never loses to

NOTE Confidence: 0.8373482

 $00:35:23.380 \longrightarrow 00:35:26.057$  monkey see and so on and so on.

NOTE Confidence: 0.8373482

 $00:35:26.060 \dashrightarrow 00:35:28.178$  And once hierarchies are formed very,

NOTE Confidence: 0.8373482

 $00:35:28.180 \longrightarrow 00:35:29.242$  they're rather stable.

NOTE Confidence: 0.8373482

00:35:29.242 --> 00:35:29.950 And so,

NOTE Confidence: 0.8373482

 $00:35:29.950 \rightarrow 00:35:31.720$  although there are important differences,

NOTE Confidence: 0.8373482

 $00:35:31.720 \dashrightarrow 00:35:34.191$  rhesus monkey social status is a good

NOTE Confidence: 0.8373482

 $00:35:34.191 \rightarrow 00:35:36.319$  proxy of socioeconomic status in humans,

NOTE Confidence: 0.8373482

 $00:35:36.320 \dashrightarrow 00:35:38.637$  because those at the top have greater

NOTE Confidence: 0.8373482

 $00:35:38.637 \rightarrow 00:35:40.918$  access to resources like social partners,

- NOTE Confidence: 0.8373482
- $00:35:40.920 \longrightarrow 00:35:41.982$  desirable social partners,

 $00:35:41.982 \longrightarrow 00:35:42.690$  better food,

NOTE Confidence: 0.8373482

 $00:35:42.690 \longrightarrow 00:35:44.460$  or first access to food.

NOTE Confidence: 0.8373482

 $00:35:44.460 \rightarrow 00:35:46.782$  The best shelter which for monkeys

NOTE Confidence: 0.8373482

 $00:35:46.782 \longrightarrow 00:35:49.420$  is a shady spot on a hot day,

NOTE Confidence: 0.8373482

 $00{:}35{:}49{.}420 \dashrightarrow 00{:}35{:}52{.}024$  and both monkeys and humans use their

NOTE Confidence: 0.8373482

 $00:35:52.024 \dashrightarrow 00:35:54.339$  power to access those resources.

NOTE Confidence: 0.8373482

00:35:54.340 - > 00:35:56.860 So in our study of juvenile monkeys,

NOTE Confidence: 0.8373482

 $00:35:56.860 \longrightarrow 00:35:58.750$  we found that nursery reared

NOTE Confidence: 0.8373482

 $00:35:58.750 \longrightarrow 00:36:00.640$  juveniles both period and surrogate

NOTE Confidence: 0.8373482

00:36:00.699 --> 00:36:02.323 reared occupied lower social

NOTE Confidence: 0.8373482

 $00{:}36{:}02{.}323 \dashrightarrow 00{:}36{:}04{.}353$  ranks than mother reared monkeys.

NOTE Confidence: 0.8373482

 $00{:}36{:}04{.}360 \dashrightarrow 00{:}36{:}06{.}880$  And this was a finding that held

NOTE Confidence: 0.8373482

 $00{:}36{:}06{.}880 \dashrightarrow 00{:}36{:}09{.}425$  true for a dults as well once they

NOTE Confidence: 0.8373482

 $00:36:09.425 \rightarrow 00:36:12.030$  were eight to eight years or older.

 $00:36:12.030 \longrightarrow 00:36:14.578$  But we had an interesting caveat here.

NOTE Confidence: 0.8373482

 $00:36:14.580 \longrightarrow 00:36:17.500$  So we looked to see whether her cortisol,

NOTE Confidence: 0.8373482

00:36:17.500 - 00:36:18.996 the chronic stress measure,

NOTE Confidence: 0.8373482

 $00{:}36{:}18.996 \dashrightarrow 00{:}36{:}21.649$  could was affiliated with social rank and

NOTE Confidence: 0.8373482

00:36:21.649 --> 00:36:24.064 in adulthood only for Mother Period monkeys,

NOTE Confidence: 0.8373482

 $00{:}36{:}24.070 \dashrightarrow 00{:}36{:}26.260$  which is the solid black line.

NOTE Confidence: 0.8373482

 $00{:}36{:}26.260 \dashrightarrow 00{:}36{:}28.070$  Was there significant correlation such

NOTE Confidence: 0.8373482

 $00:36:28.070 \longrightarrow 00:36:30.296$  that mother period monkeys with higher

NOTE Confidence: 0.8373482

 $00:36:30.296 \rightarrow 00:36:32.468$  her cortisol indicative of greater stress,

NOTE Confidence: 0.8373482

 $00:36:32.470 \longrightarrow 00:36:34.440$  ranked lower on the hierarchy?

NOTE Confidence: 0.8373482

 $00{:}36{:}34{.}440 \dashrightarrow 00{:}36{:}35{.}984$  But this a filler.

NOTE Confidence: 0.8373482

 $00{:}36{:}35{.}984 \dashrightarrow 00{:}36{:}37{.}914$  This relationship was not present

NOTE Confidence: 0.8373482

 $00{:}36{:}37{.}914 \dashrightarrow 00{:}36{:}40{.}098$  for the nursery room monkeys,

NOTE Confidence: 0.8373482

 $00:36:40.100 \longrightarrow 00:36:43.610$  so we look back in time to that stressful

NOTE Confidence: 0.8373482

 $00{:}36{:}43.610 \dashrightarrow 00{:}36{:}45.987$  relocation and we found that once

NOTE Confidence: 0.8373482

 $00:36:45.987 \rightarrow 00:36:48.580$  again from other peer reared monkeys,

- NOTE Confidence: 0.8373482
- $00:36:48.580 \rightarrow 00:36:50.998$  only their ability to regulate cortisol,

 $00:36:51.000 \dashrightarrow 00:36:53.220$  their changes in cortisol across

NOTE Confidence: 0.8373482

 $00:36:53.220 \rightarrow 00:36:54.996$  several months following relocation

NOTE Confidence: 0.8373482

 $00:36:54.996 \rightarrow 00:36:56.572$  significantly predicted their dominant

NOTE Confidence: 0.8373482

 $00:36:56.572 \rightarrow 00:36:59.071$  status only if they were mother appeared,

NOTE Confidence: 0.8373482

 $00{:}36{:}59{.}080 \dashrightarrow 00{:}37{:}02{.}080$  and so this suggests that there

NOTE Confidence: 0.8373482

 $00:37:02.080 \longrightarrow 00:37:04.450$  is a stress regulation is.

NOTE Confidence: 0.8373482

 $00{:}37{:}04{.}450 \dashrightarrow 00{:}37{:}06{.}508$  Is out of wack in nursery monkeys

NOTE Confidence: 0.8373482

 $00{:}37{:}06{.}508 \dashrightarrow 00{:}37{:}08{.}319$  an that this dys regulation likely

NOTE Confidence: 0.8373482

 $00{:}37{:}08{.}319 \dashrightarrow 00{:}37{:}10{.}893$  begins in a dolescence and maybe a

NOTE Confidence: 0.8373482

 $00:37:10.893 \dashrightarrow 00:37:13.100$  predictor of adult social status.

NOTE Confidence: 0.822889

00:37:15.530 --> 00:37:17.624 So recall that I just showed

NOTE Confidence: 0.822889

 $00:37:17.624 \dashrightarrow 00:37:19.441$  you that higher ranking monkeys

NOTE Confidence: 0.822889

 $00{:}37{:}19{.}441 \dashrightarrow 00{:}37{:}21{.}565$  are more likely to be mother,

NOTE Confidence: 0.822889

 $00{:}37{:}21.570 \dashrightarrow 00{:}37{:}23.652$  period, and this is a particular

 $00:37:23.652 \rightarrow 00:37:25.470$  importance for this next study,

NOTE Confidence: 0.822889

 $00{:}37{:}25{.}470 \dashrightarrow 00{:}37{:}27{.}170$  which examined differential DNA metalation

NOTE Confidence: 0.822889

 $00:37:27.170 \longrightarrow 00:37:29.665$  in the placenta of high middle ranking

NOTE Confidence: 0.822889

 $00:37:29.665 \rightarrow 00:37:31.505$  monkeys versus low ranking monkeys.

NOTE Confidence: 0.822889

00:37:31.510 -> 00:37:33.560 And remember the high ranking

NOTE Confidence: 0.822889

 $00{:}37{:}33{.}560 \dashrightarrow 00{:}37{:}36{.}068$  monkey placent as are more likely to

NOTE Confidence: 0.822889

 $00{:}37{:}36.068 \dashrightarrow 00{:}37{:}37.998$  come from mother period animals.

NOTE Confidence: 0.822889

 $00{:}37{:}38.000 \dashrightarrow 00{:}37{:}40.142$  And so we studied DNA methylation

NOTE Confidence: 0.822889

 $00{:}37{:}40.142 \dashrightarrow 00{:}37{:}42.828$  as another way to look under this

NOTE Confidence: 0.822889

 $00:37:42.828 \longrightarrow 00:37:44.793$  skin because DNA changes the

NOTE Confidence: 0.822889

 $00{:}37{:}44.793 \dashrightarrow 00{:}37{:}47.458$  activity of a DNA sequence without

NOTE Confidence: 0.822889

 $00{:}37{:}47{.}458$  -->  $00{:}37{:}49{.}718$  changing its structure or sequence.

NOTE Confidence: 0.822889

 $00:37:49.720 \longrightarrow 00:37:50.646$  An importantly,

NOTE Confidence: 0.822889

 $00:37:50.646 \rightarrow 00:37:52.498$  because Miss Metalation typically

NOTE Confidence: 0.822889

 $00{:}37{:}52.498 \dashrightarrow 00{:}37{:}55.499$  acts to alter later gene expression.

NOTE Confidence: 0.822889

 $00:37:55.500 \dashrightarrow 00:37:57.294$  And so we found dramatic differences

- NOTE Confidence: 0.822889
- $00:37:57.294 \rightarrow 00:37:59.132$  in DNA methylation in the placenta

 $00:37:59.132 \rightarrow 00:38:00.896$  of monkeys that were high ranking

NOTE Confidence: 0.822889

00:38:00.896 --> 00:38:01.950 versus low ranking,

NOTE Confidence: 0.822889

 $00:38:01.950 \longrightarrow 00:38:03.792$  and that's what this heat map

NOTE Confidence: 0.822889

 $00:38:03.792 \longrightarrow 00:38:05.020$  here is showing you.

NOTE Confidence: 0.822889

00:38:05.020 --> 00:38:07.468 All you need to know is the high,

NOTE Confidence: 0.822889

00:38:07.470 --> 00:38:08.439 medium, low rank,

NOTE Confidence: 0.822889

 $00:38:08.439 \rightarrow 00:38:10.377$  high medium ranking monkeys are on

NOTE Confidence: 0.822889

 $00{:}38{:}10{.}377 \dashrightarrow 00{:}38{:}12{.}425$  the left side and the low ranking

NOTE Confidence: 0.822889

 $00:38:12.425 \longrightarrow 00:38:14.230$  monkeys are on the right side.

NOTE Confidence: 0.822889

 $00{:}38{:}14{.}230 \dashrightarrow 00{:}38{:}16{.}127$  An blue is low levels of metalation

NOTE Confidence: 0.822889

 $00{:}38{:}16{.}127 \dashrightarrow 00{:}38{:}18{.}218$  red is high levels of metalation.

NOTE Confidence: 0.822889

 $00{:}38{:}18{.}220 \dashrightarrow 00{:}38{:}20{.}434$  You could see that their patterns

NOTE Confidence: 0.822889

 $00:38:20.434 \rightarrow 00:38:21.910$  of methylations are essentially

NOTE Confidence: 0.822889

 $00:38:21.973 \longrightarrow 00:38:23.110$  opposite each other.

- $00:38:23.110 \longrightarrow 00:38:24.162$  And further,
- NOTE Confidence: 0.822889
- $00{:}38{:}24.162 \dashrightarrow 00{:}38{:}26.792$  exploration revealed that the dramatic
- NOTE Confidence: 0.822889
- $00:38:26.792 \dashrightarrow 00:38:29.451$  differences in Diamet DNA metalation
- NOTE Confidence: 0.822889
- $00{:}38{:}29{.}451 \dashrightarrow 00{:}38{:}31{.}971$  were particularly located in networks
- NOTE Confidence: 0.822889
- $00:38:31.971 \dashrightarrow 00:38:34.929$  that are critical to cell morphology,
- NOTE Confidence: 0.822889
- $00{:}38{:}34{.}930 \dashrightarrow 00{:}38{:}36{.}986$  cell growth and differentiation,
- NOTE Confidence: 0.822889
- $00:38:36.986 \longrightarrow 00:38:38.528$  and cell signaling.
- NOTE Confidence: 0.822889
- 00:38:38.530 --> 00:38:39.558 All vital,
- NOTE Confidence: 0.822889
- 00:38:39.558 --> 00:38:40.586 important, vital,
- NOTE Confidence: 0.822889
- $00:38:40.586 \rightarrow 00:38:43.156$  and functions for placental Physiology.
- NOTE Confidence: 0.822889
- $00{:}38{:}43.160 \dashrightarrow 00{:}38{:}45.626$  We also found that the upstream
- NOTE Confidence: 0.822889
- $00:38:45.626 \rightarrow 00:38:48.687$  regulators of these gene networks included
- NOTE Confidence: 0.822889
- 00:38:48.687 --> 00:38:51.375 glucocorticoid receptor target genes,
- NOTE Confidence: 0.822889
- $00:38:51.380 \longrightarrow 00:38:54.020$  which indicates to us that.
- NOTE Confidence: 0.822889
- $00{:}38{:}54{.}020 \dashrightarrow 00{:}38{:}56{.}035$  The stress stress response is
- NOTE Confidence: 0.822889
- $00:38:56.035 \rightarrow 00:38:57.244$  particularly important here,

- NOTE Confidence: 0.822889
- $00:38:57.250 \longrightarrow 00:38:59.674$  and so the broad scope of

 $00:38:59.674 \rightarrow 00:39:00.886$  methylation differences here,

NOTE Confidence: 0.822889

 $00{:}39{:}00{.}890 \dashrightarrow 00{:}39{:}03{.}641$  as well as the fact that these

NOTE Confidence: 0.822889

 $00:39:03.641 \rightarrow 00:39:05.330$  metalation differences affected tissue.

NOTE Confidence: 0.822889

 $00:39:05.330 \rightarrow 00:39:07.350$  That's vital for fetal development,

NOTE Confidence: 0.822889

 $00{:}39{:}07{.}350 \dashrightarrow 00{:}39{:}09{.}370$  really illustrates the profound biological

NOTE Confidence: 0.822889

 $00:39:09.370 \longrightarrow 00:39:11.390$  effect that socialrank likely achieved,

NOTE Confidence: 0.822889

 $00:39:11.390 \longrightarrow 00:39:13.410$  partly by early rearing may

NOTE Confidence: 0.822889

 $00:39:13.410 \longrightarrow 00:39:15.430$  have on the next generation,

NOTE Confidence: 0.822889

 $00:39:15.430 \longrightarrow 00:39:17.450$  and this is important because

NOTE Confidence: 0.822889

00:39:17.450 --> 00:39:19.470 in translating it to humans,

NOTE Confidence: 0.822889

 $00:39:19.470 \longrightarrow 00:39:21.505$  these have really important implications

NOTE Confidence: 0.822889

 $00:39:21.505 \longrightarrow 00:39:24.010$  for our understanding of the impacts

NOTE Confidence: 0.822889

 $00{:}39{:}24.010 \dashrightarrow 00{:}39{:}26.025$  of social equality or inequality.

NOTE Confidence: 0.822889

 $00:39:26.030 \rightarrow 00:39:29.630$  Of the well being and care of pregnant women,
$00:39:29.630 \longrightarrow 00:39:32.030$  and it underscores the need for

NOTE Confidence: 0.822889

 $00{:}39{:}32{.}030 \dashrightarrow 00{:}39{:}33{.}630$  appropriate interventions for women,

NOTE Confidence: 0.822889

 $00:39:33.630 \longrightarrow 00:39:35.885$  particularly those who may be

NOTE Confidence: 0.822889

00:39:35.885 - 00:39:37.689 disadvantaged and more likely

NOTE Confidence: 0.822889

 $00{:}39{:}37{.}689 \dashrightarrow 00{:}39{:}40{.}109$  to suffer from social stress.

NOTE Confidence: 0.822889

 $00:39:40.110 \longrightarrow 00:39:42.231$  And so this body of work represented

NOTE Confidence: 0.822889

 $00:39:42.231 \longrightarrow 00:39:44.750$  one of our first forays into

NOTE Confidence: 0.822889

 $00:39:44.750 \longrightarrow 00:39:46.295$  the intergenerational effects.

NOTE Confidence: 0.822889

 $00{:}39{:}46{.}300 \dashrightarrow 00{:}39{:}47{.}888$  Of early secure attachments.

NOTE Confidence: 0.822889

 $00{:}39{:}47.888 \dashrightarrow 00{:}39{:}50.270$  Because the placenta is of fetal

NOTE Confidence: 0.822889

00:39:50.343 --> 00:39:52.576 origin and so therefore we may be

NOTE Confidence: 0.822889

 $00:39:52.576 \rightarrow 00:39:55.035$  starting to see here in this study

NOTE Confidence: 0.822889

 $00{:}39{:}55{.}035 \dashrightarrow 00{:}39{:}56{.}825$  the impacts of secure attachments

NOTE Confidence: 0.822889

 $00:39:56.825 \rightarrow 00:39:58.279$  on the next generation.

NOTE Confidence: 0.86156857

 $00:40:02.060 \longrightarrow 00:40:04.796$  So only now has it been possible to

NOTE Confidence: 0.86156857

 $00:40:04.796 \longrightarrow 00:40:07.197$  extend the findings of Goon Park.

 $00:40:07.200 \rightarrow 00:40:08.808$  Beyond offspring development an

NOTE Confidence: 0.86156857

 $00{:}40{:}08.808 \dashrightarrow 00{:}40{:}10.416$  into multiple generations and

NOTE Confidence: 0.86156857

 $00:40:10.416 \longrightarrow 00:40:12.909$  we can do this now because we

NOTE Confidence: 0.86156857

00:40:12.909 - 00:40:14.534 have transferred the entire NCH,

NOTE Confidence: 0.86156857

 $00:40:14.540 \longrightarrow 00:40:16.370$  the rhesus monkey data set.

NOTE Confidence: 0.86156857

 $00:40:16.370 \longrightarrow 00:40:17.838$  Both biological and behavioral

NOTE Confidence: 0.86156857

 $00:40:17.838 \longrightarrow 00:40:20.040$  to the Yale Child Study Center.

NOTE Confidence: 0.86156857

 $00:40:20.040 \rightarrow 00:40:22.692$  So we now hold longitudinal perspective

NOTE Confidence: 0.86156857

 $00{:}40{:}22.692 \dashrightarrow 00{:}40{:}24.819$  and comprehensive data collected over

NOTE Confidence: 0.86156857

 $00:40:24.819 \longrightarrow 00:40:27.131$  the course of 25 years or more on

NOTE Confidence: 0.86156857

 $00{:}40{:}27.131 \dashrightarrow 00{:}40{:}28.907$  multiple generations of monkeys in

NOTE Confidence: 0.86156857

 $00{:}40{:}28{.}907 \dashrightarrow 00{:}40{:}31{.}504$  sufficient numbers to be able to begin.

NOTE Confidence: 0.86156857

 $00{:}40{:}31{.}504 \dashrightarrow 00{:}40{:}33{.}774$  To rigorously test the causal

NOTE Confidence: 0.86156857

 $00{:}40{:}33.774 \dashrightarrow 00{:}40{:}35.590$  influences of disruptions to

NOTE Confidence: 0.86156857

 $00{:}40{:}35.665 \dashrightarrow 00{:}40{:}37.515$  early secure attachments and some

 $00:40:37.515 \longrightarrow 00:40:40.000$  of the data we hold include.

NOTE Confidence: 0.86156857

00:40:40.000 --> 00:40:42.725 Thousands like 25,000 or more

NOTE Confidence: 0.86156857

00:40:42.725 --> 00:40:44.910 biological samples, blood plasma,

NOTE Confidence: 0.86156857

00:40:44.910 --> 00:40:47.090 Cerebro, spinal fluid saliva,

NOTE Confidence: 0.86156857

00:40:47.090 --> 00:40:48.722 extracted DNA RNA,

NOTE Confidence: 0.86156857

 $00{:}40{:}48.722 \dashrightarrow 00{:}40{:}51.986$  white blood samples and hair samples,

NOTE Confidence: 0.86156857

 $00:40:51.990 \longrightarrow 00:40:53.080$  among others.

NOTE Confidence: 0.86156857

 $00:40:53.080 \rightarrow 00:40:55.805$  We hold extensive neonatal assessments,

NOTE Confidence: 0.86156857

 $00{:}40{:}55{.}810 \dashrightarrow 00{:}40{:}57{.}565$  measuring neurological development

NOTE Confidence: 0.86156857

 $00{:}40{:}57.565 \dashrightarrow 00{:}41{:}01.075$  and function across the first month

NOTE Confidence: 0.86156857

 $00{:}41{:}01.075 \dashrightarrow 00{:}41{:}04.068$  of life on multiple generations.

NOTE Confidence: 0.86156857

 $00:41:04.070 \longrightarrow 00:41:05.980$  And we have health records,

NOTE Confidence: 0.86156857

00:41:05.980 --> 00:41:07.500 weight and BMI data,

NOTE Confidence: 0.86156857

 $00:41:07.500 \rightarrow 00:41:09.022$  pregnancy outcomes, social behavior,

NOTE Confidence: 0.86156857

 $00{:}41{:}09{.}022 \dashrightarrow 00{:}41{:}10{.}927$  rank data and much more.

NOTE Confidence: 0.86808455

 $00:41:13.970 \longrightarrow 00:41:16.602$  And one of the aspects that makes this

00:41:16.602 --> 00:41:18.998 archival data set such a goldmine and so

NOTE Confidence: 0.86808455

00:41:18.998 --> 00:41:21.727 unique is that we have data on multiple

NOTE Confidence: 0.86808455

 $00{:}41{:}21.727 \dashrightarrow 00{:}41{:}24.043$  generations of monkeys that were reared NOTE Confidence: 0.86808455

 $00:41:24.050 \rightarrow 00:41:27.056$  in one of four different sequences.

NOTE Confidence: 0.86808455

 $00{:}41{:}27.060 \dashrightarrow 00{:}41{:}29.394$  So we help now hold intergenerational

NOTE Confidence: 0.86808455

 $00{:}41{:}29{.}394 \dashrightarrow 00{:}41{:}32{.}144$  data on mother offspring pairs that were

NOTE Confidence: 0.86808455

 $00{:}41{:}32{.}144 \dashrightarrow 00{:}41{:}34{.}271$  either mother, period, mother period.

NOTE Confidence: 0.86808455

 $00{:}41{:}34{.}271 \dashrightarrow 00{:}41{:}36{.}556$  So the mothers themselves were

NOTE Confidence: 0.86808455

 $00{:}41{:}36{.}556 \dashrightarrow 00{:}41{:}39{.}375$  weird with their mothers and their

NOTE Confidence: 0.86808455

 $00:41:39.375 \longrightarrow 00:41:41.199$  infants were mother reared.

NOTE Confidence: 0.86808455

00:41:41.200 --> 00:41:43.504 Or we have a data on monkeys who

NOTE Confidence: 0.86808455

 $00:41:43.504 \rightarrow 00:41:45.260$  were reared by their mothers,

NOTE Confidence: 0.86808455

 $00{:}41{:}45{.}260 \dashrightarrow 00{:}41{:}48{.}606$  but their infants reared in the nursery.

NOTE Confidence: 0.86808455

00:41:48.610 --> 00:41:50.442 We have data on monkeys who were who

NOTE Confidence: 0.86808455

 $00{:}41{:}50{.}442 \dashrightarrow 00{:}41{:}52{.}388$  were the mothers were nursery reared,

 $00:41:52.390 \rightarrow 00:41:54.010$  and their infants were also nursery.

NOTE Confidence: 0.86808455

 $00{:}41{:}54.010 \dashrightarrow 00{:}41{:}55.630$  Weird and where mothers were nurtured.

NOTE Confidence: 0.86808455

 $00:41:55.630 \rightarrow 00:41:59.008$  But they reared their own infants.

NOTE Confidence: 0.86808455

 $00{:}41{:}59{.}010 \dashrightarrow 00{:}42{:}01{.}970$  And so, several years ago we forged a

NOTE Confidence: 0.86808455

 $00{:}42{:}01{.}970 \dashrightarrow 00{:}42{:}03{.}668$  unique collaboration with behavioral

NOTE Confidence: 0.86808455

 $00{:}42{:}03.668 \dashrightarrow 00{:}42{:}06.344$  economists at the University of Chicago,

NOTE Confidence: 0.86808455

00:42:06.350 --> 00:42:08.798 led by Doctor James Heckman, who,

NOTE Confidence: 0.86808455

 $00{:}42{:}08.798 \dashrightarrow 00{:}42{:}11.246$  as Andres mentioned at the outset,

NOTE Confidence: 0.86808455

 $00{:}42{:}11{.}250 \dashrightarrow 00{:}42{:}14{.}506$  was the Nobel Laureate in Economics in 2000,

NOTE Confidence: 0.86808455

 $00{:}42{:}14.510 \dashrightarrow 00{:}42{:}17.518$  and is best known for his birth to

NOTE Confidence: 0.86808455

 $00{:}42{:}17.518 \dashrightarrow 00{:}42{:}20.229$  five research and policy advocacy now.

NOTE Confidence: 0.86808455

 $00:42:20.230 \longrightarrow 00:42:21.030$  This collaboration,

NOTE Confidence: 0.86808455

 $00:42:21.030 \rightarrow 00:42:23.030$  previously found single generation effects

NOTE Confidence: 0.86808455

 $00:42:23.030 \rightarrow 00:42:25.120$  of different early life experiences,

NOTE Confidence: 0.86808455

 $00:42:25.120 \longrightarrow 00:42:27.610$  so the work found that that

NOTE Confidence: 0.86808455

 $00:42:27.610 \rightarrow 00:42:28.855$  monkeys experiencing adverse.

- NOTE Confidence: 0.86808455
- $00{:}42{:}28.860 \dashrightarrow 00{:}42{:}32.036$  Adversity early in life via lack of a

 $00{:}42{:}32.036 \dashrightarrow 00{:}42{:}34.454$  secure attachment had adverse health

NOTE Confidence: 0.86808455

 $00:42:34.454 \rightarrow 00:42:37.029$  outcomes in adolescence and adulthood.

NOTE Confidence: 0.86808455

 $00:42:37.030 \longrightarrow 00:42:39.543$  But we're now extending this work with

NOTE Confidence: 0.86808455

 $00:42:39.543 \rightarrow 00:42:41.539$  the collaborators of pictured here,

NOTE Confidence: 0.86808455

 $00{:}42{:}41{.}540 \dashrightarrow 00{:}42{:}43{.}801$  to study the causal effects of different

NOTE Confidence: 0.86808455

00:42:43.801 --> 00:42:46.050 early attachments on subsequent generations,

NOTE Confidence: 0.86808455

 $00:42:46.050 \rightarrow 00:42:48.535$  and this is the work I'm going

NOTE Confidence: 0.86808455

 $00:42:48.535 \longrightarrow 00:42:50.570$  to finish out with today.

NOTE Confidence: 0.86808455

 $00{:}42{:}50{.}570 \dashrightarrow 00{:}42{:}52{.}496$  So with funding from the National

NOTE Confidence: 0.86808455

 $00:42:52.496 \longrightarrow 00:42:53.780$  Science Foundation in this

NOTE Confidence: 0.86808455

 $00{:}42{:}53.841 \dashrightarrow 00{:}42{:}55.449$  first intergenerational study,

NOTE Confidence: 0.86808455

 $00{:}42{:}55{.}450 \dashrightarrow 00{:}42{:}57{.}748$  we capitalized on the randomization of

NOTE Confidence: 0.86808455

 $00{:}42{:}57.748 \dashrightarrow 00{:}43{:}00.036$  early life experiences in monkeys to

NOTE Confidence: 0.86808455

 $00{:}43{:}00{.}036 \dashrightarrow 00{:}43{:}02{.}465$  quantify the degree of the impact that

 $00:43:02.465 \rightarrow 00:43:04.849$  maternal presence has on offspring health.

NOTE Confidence: 0.86808455

 $00:43:04.850 \rightarrow 00:43:07.208$  And we published these findings recently.

NOTE Confidence: 0.86808455

 $00{:}43{:}07{.}210 \dashrightarrow 00{:}43{:}09{.}513$  In a working paper at the National

NOTE Confidence: 0.86808455

00:43:09.513 --> 00:43:11.130 Bureau of Economic Research,

NOTE Confidence: 0.86808455

 $00{:}43{:}11{.}130 \dashrightarrow 00{:}43{:}13{.}300$  and we address a major limitation in

NOTE Confidence: 0.86808455

 $00{:}43{:}13{.}300 \dashrightarrow 00{:}43{:}15{.}719$  human studies by being able to carefully

NOTE Confidence: 0.86808455

 $00:43:15.719 \rightarrow 00:43:17.861$  control the early life experiences of

NOTE Confidence: 0.86808455

 $00:43:17.921 \rightarrow 00:43:20.375$  monkeys and study them across generations.

NOTE Confidence: 0.86808455

 $00{:}43{:}20{.}380 \dashrightarrow 00{:}43{:}22{.}762$  And so these four rearing sequences

NOTE Confidence: 0.86808455

 $00:43:22.762 \longrightarrow 00:43:25.333$  that I just showed you allow us

NOTE Confidence: 0.86808455

 $00:43:25.333 \longrightarrow 00:43:27.145$  to test on the one hand,

NOTE Confidence: 0.86808455

 $00:43:27.150 \rightarrow 00:43:28.930$  the potential benefit of sustained,

NOTE Confidence: 0.86808455

 $00:43:28.930 \longrightarrow 00:43:30.490$  secure attachment across generations

NOTE Confidence: 0.86808455

 $00:43:30.490 \longrightarrow 00:43:33.178$  here in the Blue Square and on

NOTE Confidence: 0.86808455

 $00:43:33.178 \longrightarrow 00:43:35.180$  the other hand we can also test

NOTE Confidence: 0.86808455

 $00:43:35.180 \rightarrow 00:43:37.219$  whether it's possible to compensate.

- NOTE Confidence: 0.86808455
- $00:43:37.220 \longrightarrow 00:43:40.178$  For a lack of secure attachment.
- NOTE Confidence: 0.86808455
- $00{:}43{:}40{.}180 \dashrightarrow 00{:}43{:}43{.}120$  Here in the red, on the right,
- NOTE Confidence: 0.86808455
- $00:43:43.120 \longrightarrow 00:43:45.886$  and by comparing the differences in
- NOTE Confidence: 0.86808455
- $00:43:45.886 \rightarrow 00:43:47.730$  outcomes between the intergenerational
- NOTE Confidence: 0.86808455
- $00:43:47.798 \longrightarrow 00:43:49.418$  groups here in the orange,
- NOTE Confidence: 0.86808455
- $00{:}43{:}49{.}420 \dashrightarrow 00{:}43{:}51{.}682$  we can describe how the effects
- NOTE Confidence: 0.86808455
- $00:43:51.682 \longrightarrow 00:43:54.220$  on the offspring depend on the
- NOTE Confidence: 0.86808455
- $00:43:54.220 \rightarrow 00:43:56.140$  parents early rearing environments.
- NOTE Confidence: 0.86808455
- $00{:}43{:}56{.}140 \dashrightarrow 00{:}43{:}58{.}660$  An this comparison is something that
- NOTE Confidence: 0.86808455
- $00{:}43{:}58{.}660 \dashrightarrow 00{:}43{:}59{.}920$  economists call intergenerational
- NOTE Confidence: 0.86808455
- $00:43:59.920 \longrightarrow 00:44:00.340$  complementarity,
- NOTE Confidence: 0.86808455
- $00{:}44{:}00{.}340 \dashrightarrow 00{:}44{:}02{.}500$  and this analysis allows us to
- NOTE Confidence: 0.86808455
- $00:44:02.500 \longrightarrow 00:44:04.857$  learn more than just the benefit
- NOTE Confidence: 0.86808455
- $00{:}44{:}04{.}857 \dashrightarrow 00{:}44{:}07{.}395$  of secure attachments in a single
- NOTE Confidence: 0.86808455
- $00{:}44{:}07{.}395 \dashrightarrow 00{:}44{:}09{.}730$  generation the mother's generation.
- NOTE Confidence: 0.86808455

 $00:44:09.730 \longrightarrow 00:44:12.352$  We can now learn about the

NOTE Confidence: 0.86808455

 $00:44:12.352 \longrightarrow 00:44:13.663$  importance of sustained,

NOTE Confidence: 0.86808455

00:44:13.670 --> 00:44:15.410 secure attachments across generations,

NOTE Confidence: 0.86808455

 $00:44:15.410 \rightarrow 00:44:18.519$  as well as the importance of investing NOTE Confidence: 0.86808455

00:44:18.519 --> 00:44:21.093 early in the parents generation versus

NOTE Confidence: 0.86808455

 $00{:}44{:}21.093 \dashrightarrow 00{:}44{:}23.753$  trying to compare or to compensate NOTE Confidence: 0.86808455

 $00:44:23.753 \rightarrow 00:44:25.497$  in the offspring's generation.

NOTE Confidence: 0.86808455

00:44:25.500 --> 00:44:27.875 So our behavioral economics economist

NOTE Confidence: 0.86808455

 $00:44:27.875 \rightarrow 00:44:30.250$  friends use their sophisticated equation NOTE Confidence: 0.86808455

 $00:44:30.316 \rightarrow 00:44:32.506$  modeling to conduct all these tests,

NOTE Confidence: 0.849866

00:44:32.510 --> 00:44:35.360 which I call fancy voodoo magic

NOTE Confidence: 0.849866

 $00{:}44{:}35{.}360 \dashrightarrow 00{:}44{:}38{.}140$  and to calculate these benefits.

NOTE Confidence: 0.849866

 $00{:}44{:}38{.}140 \dashrightarrow 00{:}44{:}40{.}772$  So we relied on archival data from

NOTE Confidence: 0.849866

00:44:40.772 --> 00:44:43.076 over 650 mother offspring pairs

NOTE Confidence: 0.849866

 $00{:}44{:}43.076 \dashrightarrow 00{:}44{:}45.272$  with roughly equal representation

NOTE Confidence: 0.849866

 $00:44:45.272 \rightarrow 00:44:48.300$  across the four rearing sequences.

- NOTE Confidence: 0.849866
- $00:44:48.300 \longrightarrow 00:44:50.388$  An we first focused on initial

 $00{:}44{:}50{.}388 \dashrightarrow 00{:}44{:}51{.}084$  intergenerational impacts,

NOTE Confidence: 0.849866

 $00:44:51.090 \rightarrow 00:44:53.388$  namely pregnancy outcomes did the infant's

NOTE Confidence: 0.849866

 $00:44:53.388 \rightarrow 00:44:56.328$  birth result in a live birth yes or no?

NOTE Confidence: 0.849866

 $00{:}44{:}56{.}330 \dashrightarrow 00{:}44{:}58{.}724$  Did the infant survive past the first

NOTE Confidence: 0.849866

 $00:44:58.724 \rightarrow 00:45:01.209$  month and what was its birth weight?

NOTE Confidence: 0.849866

 $00{:}45{:}01{.}210 \dashrightarrow 00{:}45{:}03{.}256$  And these can be considered pre

NOTE Confidence: 0.849866

 $00{:}45{:}03.256 \dashrightarrow 00{:}45{:}05.388$  treatment outcomes since most of them

NOTE Confidence: 0.849866

 $00{:}45{:}05{.}388 \dashrightarrow 00{:}45{:}07{.}148$  occur prior to randomize conditions.

NOTE Confidence: 0.8479589

 $00{:}45{:}09{.}470 \dashrightarrow 00{:}45{:}11{.}435$  Now we found no intergenerational

NOTE Confidence: 0.8479589

 $00:45:11.435 \longrightarrow 00:45:13.819$  effect on the probability of an

NOTE Confidence: 0.8479589

 $00{:}45{:}13.819 \dashrightarrow 00{:}45{:}15.564$  offspring being born live versus

NOTE Confidence: 0.8479589

 $00{:}45{:}15{.}564 \dashrightarrow 00{:}45{:}17{.}849$  stillborn or on its birth weight.

NOTE Confidence: 0.8479589

 $00{:}45{:}17.850 \dashrightarrow 00{:}45{:}20.220$  But we did find significant intergenerational

NOTE Confidence: 0.8479589

 $00{:}45{:}20{.}220 \dashrightarrow 00{:}45{:}21{.}800$  effect on infant survivability,

 $00{:}45{:}21.800 \dashrightarrow 00{:}45{:}25.072$  so infants of moms who were reared with

NOTE Confidence: 0.8479589

 $00{:}45{:}25{.}072 \dashrightarrow 00{:}45{:}27{.}791$  their mothers had a survival rate that

NOTE Confidence: 0.8479589

 $00{:}45{:}27.791 \dashrightarrow 00{:}45{:}30.100$  was 2.9% higher than infants reared

NOTE Confidence: 0.8479589

 $00:45:30.100 \rightarrow 00:45:32.470$  by mothers who were nursery rears.

NOTE Confidence: 0.8479589

 $00{:}45{:}32{.}470 \dashrightarrow 00{:}45{:}36{.}187$  I'll say that one more time the infants and

NOTE Confidence: 0.8479589

 $00{:}45{:}36{.}187 \dashrightarrow 00{:}45{:}39{.}605$  mothers whose own mothers were mother weird.

NOTE Confidence: 0.8479589

 $00:45:39.610 \longrightarrow 00:45:43.467$  Had a 2.9% higher survival rate than

NOTE Confidence: 0.8479589

 $00:45:43.467 \rightarrow 00:45:47.118$  infants whose mothers were nursery reared.

NOTE Confidence: 0.8479589

 $00{:}45{:}47.120 \dashrightarrow 00{:}45{:}49.580$  So we then examine long term

NOTE Confidence: 0.8479589

 $00:45:49.580 \rightarrow 00:45:50.400$  intergenerational impacts,

NOTE Confidence: 0.8479589

 $00{:}45{:}50{.}400 \dashrightarrow 00{:}45{:}52{.}860$  both of which occurred after the

NOTE Confidence: 0.8479589

 $00:45:52.860 \rightarrow 00:45:54.500$  experimental rearing conditions ended.

NOTE Confidence: 0.8479589

 $00:45:54.500 \longrightarrow 00:45:55.730$  After that relocation,

NOTE Confidence: 0.8479589

 $00:45:55.730 \longrightarrow 00:45:57.780$  and unlike the previous results,

NOTE Confidence: 0.8479589

 $00{:}45{:}57{.}780 \dashrightarrow 00{:}45{:}59{.}946$  these outcomes can be affected both

NOTE Confidence: 0.8479589

 $00:45:59.946 \rightarrow 00:46:02.399$  by the mother's ring condition and

- NOTE Confidence: 0.8479589
- $00:46:02.399 \rightarrow 00:46:04.749$  the offspring zone rearing condition.

 $00:46:04.750 \rightarrow 00:46:07.620$  One of these outcomes was adolescent health,

NOTE Confidence: 0.8479589

00:46:07.620 --> 00:46:10.080 measured at one to three years,

NOTE Confidence: 0.8479589

 $00:46:10.080 \longrightarrow 00:46:12.798$  which is approximately 4 to 4

NOTE Confidence: 0.8479589

 $00:46:12.798 \longrightarrow 00:46:15.440$  to 12 years in humans.

NOTE Confidence: 0.8479589

 $00:46:15.440 \longrightarrow 00:46:18.121$  And for this we looked at the

NOTE Confidence: 0.8479589

 $00:46:18.121 \longrightarrow 00:46:20.413$  percentage of quarterly vet exams in

NOTE Confidence: 0.8479589

 $00:46:20.413 \longrightarrow 00:46:22.891$  which the animal was in good health,

NOTE Confidence: 0.8479589

 $00:46:22.900 \rightarrow 00:46:25.301$  meaning the animal did not require treatment

NOTE Confidence: 0.8479589

 $00:46:25.301 \rightarrow 00:46:27.749$  for a problem like wounding diarrhea,

NOTE Confidence: 0.8479589

00:46:27.750 --> 00:46:29.988 which is common in monkey colonies,

NOTE Confidence: 0.8479589

00:46:29.990 --> 00:46:30.734 skin rash,

NOTE Confidence: 0.8479589

 $00:46:30.734 \longrightarrow 00:46:31.850$  dermatitis surgeries, etc.

NOTE Confidence: 0.8479589

 $00{:}46{:}31{.}850 \dashrightarrow 00{:}46{:}33{.}655$  And in a dulthood we measured

NOTE Confidence: 0.8479589

 $00{:}46{:}33.655 \dashrightarrow 00{:}46{:}35.099$  their social rank attainment

 $00:46:35.099 \rightarrow 00:46:37.068$  and this was actually earlier.

NOTE Confidence: 0.8479589

 $00{:}46{:}37{.}070 \dashrightarrow 00{:}46{:}40{.}427$  The age span range from 2 to 15 years,

NOTE Confidence: 0.8479589

 $00:46:40.430 \longrightarrow 00:46:43.496$  but the majority of animals were

NOTE Confidence: 0.8479589

 $00:46:43.496 \longrightarrow 00:46:44.518$  in adulthood.

NOTE Confidence: 0.8479589

 $00{:}46{:}44{.}520 \dashrightarrow 00{:}46{:}47{.}663$  An the hear their relative rank in

NOTE Confidence: 0.8479589

 $00{:}46{:}47.663 \dashrightarrow 00{:}46{:}50.263$  their social groups range from 0.05

NOTE Confidence: 0.8479589

 $00:46:50.263 \longrightarrow 00:46:53.750$  lowest on the totem pole to 1.0 highest.

NOTE Confidence: 0.8479589

00:46:53.750 --> 00:46:54.146 Alright,

NOTE Confidence: 0.8479589

 $00{:}46{:}54{.}146 \dashrightarrow 00{:}46{:}56{.}918$  so for both health and social status,

NOTE Confidence: 0.8479589

 $00{:}46{:}56{.}920 \dashrightarrow 00{:}46{:}58{.}870$  the only significant effects again

NOTE Confidence: 0.8479589

 $00:46:58.870 \longrightarrow 00:47:00.820$  war for Mother period offspring

NOTE Confidence: 0.8479589

 $00:47:00.887 \longrightarrow 00:47:02.463$  whose mothers were themselves

NOTE Confidence: 0.8479589

 $00:47:02.463 \longrightarrow 00:47:04.433$  mother reared for good health.

NOTE Confidence: 0.8479589

 $00{:}47{:}04{.}440 \dashrightarrow 00{:}47{:}07{.}212$  This resulted in an increase of 6.7

NOTE Confidence: 0.8479589

 $00{:}47{:}07{.}212 \dashrightarrow 00{:}47{:}09{.}589$  percentage points and for social rank.

NOTE Confidence: 0.8479589

00:47:09.590 --> 00:47:12.758 This resulted in an increase of .17 points,

- NOTE Confidence: 0.8479589
- $00:47:12.760 \longrightarrow 00:47:14.344$  which is pretty remarkable
- NOTE Confidence: 0.8479589
- $00{:}47{:}14{.}344 \dashrightarrow 00{:}47{:}16{.}720$  considering the scope of the scale.
- NOTE Confidence: 0.8479589
- $00:47:16.720 \longrightarrow 00:47:19.390$  Here I should say there were
- NOTE Confidence: 0.8479589
- 00:47:19.390 --> 00:47:21.829 no no significant effects for
- NOTE Confidence: 0.8479589
- $00:47:21.829 \rightarrow 00:47:23.557$  other rearing sequences.
- NOTE Confidence: 0.8479589
- $00:47:23.560 \longrightarrow 00:47:25.610$  So the big question is,
- NOTE Confidence: 0.8479589
- $00{:}47{:}25.610 \dashrightarrow 00{:}47{:}27.174$  is the difference in
- NOTE Confidence: 0.8479589
- $00:47:27.174 \rightarrow 00:47:28.347$  intergenerational effects Mother
- NOTE Confidence: 0.8479589
- 00:47:28.347 --> 00:47:30.100 period versus nursery offspring?
- NOTE Confidence: 0.8479589
- $00:47:30.100 \rightarrow 00:47:31.740$  Is that statistically significant?
- NOTE Confidence: 0.8479589
- 00:47:31.740 --> 00:47:32.150 Well,
- NOTE Confidence: 0.8479589
- $00{:}47{:}32.150 \dashrightarrow 00{:}47{:}34.965$  we formally tested this again
- NOTE Confidence: 0.8479589
- $00{:}47{:}34.965 \dashrightarrow 00{:}47{:}36.654$  by measuring intergenerational
- NOTE Confidence: 0.8479589
- $00{:}47{:}36{.}654 \dashrightarrow 00{:}47{:}39{.}117$  complimentarity and the answer is yes.
- NOTE Confidence: 0.8479589
- $00{:}47{:}39{.}120 \dashrightarrow 00{:}47{:}42{.}336$  We found a strong and significant
- NOTE Confidence: 0.8479589

 $00{:}47{:}42{.}336 \dashrightarrow 00{:}47{:}43{.}944$  intergenerational complementarity such

NOTE Confidence: 0.8479589

 $00{:}47{:}43{.}944 \dashrightarrow 00{:}47{:}46{.}776$  that the effect of secure attachment

NOTE Confidence: 0.8479589

 $00{:}47{:}46.776 \dashrightarrow 00{:}47{:}49.503$  is more beneficial for offspring whose

NOTE Confidence: 0.8479589

 $00{:}47{:}49.503 \dashrightarrow 00{:}47{:}52.065$  mothers also had a secure attachment.

NOTE Confidence: 0.8479589

 $00{:}47{:}52.070 \dashrightarrow 00{:}47{:}54.650$  And the effect was as follows.

NOTE Confidence: 0.8479589

 $00:47:54.650 \longrightarrow 00:47:55.526$  Mother periods,

NOTE Confidence: 0.8479589

 $00:47:55.526 \rightarrow 00:47:58.154$  offspring time and good health was

NOTE Confidence: 0.8479589

 $00:47:58.154 \longrightarrow 00:48:00.262$  increased by 9.7% versus nurture

NOTE Confidence: 0.8479589

00:48:00.262 --> 00:48:02.026 offspring and social rank was

NOTE Confidence: 0.8479589

 $00:48:02.026 \rightarrow 00:48:04.666$  increased by .24 points more and

NOTE Confidence: 0.8479589

 $00{:}48{:}04.666 \dashrightarrow 00{:}48{:}06.686$  then for nursery reared offspring.

NOTE Confidence: 0.8479589

 $00:48:06.690 \rightarrow 00:48:09.174$  Now because only mother period offspring

NOTE Confidence: 0.8479589

 $00{:}48{:}09{.}174 \dashrightarrow 00{:}48{:}11{.}420$  can interact with their mothers.

NOTE Confidence: 0.8479589

00:48:11.420 --> 00:48:13.140 But nursery monkeys cannot.

NOTE Confidence: 0.8479589

 $00{:}48{:}13.140 \dashrightarrow 00{:}48{:}15.720$  Any positive effects on Mother Period.

NOTE Confidence: 0.8479589

 $00:48:15.720 \rightarrow 00:48:18.372$  Offspring here must be post needle

- NOTE Confidence: 0.8479589
- $00:48:18.372 \longrightarrow 00:48:20.683$  because the in uteral prenatal

 $00{:}48{:}20.683 \dashrightarrow 00{:}48{:}23.924$  effects were the same for both groups.

NOTE Confidence: 0.8479589

 $00{:}48{:}23{.}930 \dashrightarrow 00{:}48{:}25{.}710$  So we therefore conclude that

NOTE Confidence: 0.8479589

 $00:48:25.710 \longrightarrow 00:48:27.134$  the improved parenting received

NOTE Confidence: 0.8479589

00:48:27.134 --> 00:48:28.880 by Mother Period offspring,

NOTE Confidence: 0.8479589

 $00:48:28.880 \longrightarrow 00:48:30.785$  because their own mothers had

NOTE Confidence: 0.8479589

00:48:30.785 --> 00:48:32.690 secure attachments early in life.

NOTE Confidence: 0.8479589

 $00:48:32.690 \longrightarrow 00:48:34.705$  This improved parenting is the

NOTE Confidence: 0.8479589

 $00{:}48{:}34{.}705 \dashrightarrow 00{:}48{:}36{.}317$  primary channel through which

NOTE Confidence: 0.8479589

 $00:48:36.317 \longrightarrow 00:48:38.129$  early life advantage in the

NOTE Confidence: 0.8479589

 $00{:}48{:}38{.}129 \dashrightarrow 00{:}48{:}40{.}145$  parents generation in the form of

NOTE Confidence: 0.8429239

00:48:40.208 --> 00:48:42.554 a secure attachment is transmitted to

NOTE Confidence: 0.8429239

 $00{:}48{:}42.554 \dashrightarrow 00{:}48{:}44.876$  the next generation versus prenatal in NOTE Confidence: 0.8429239

 $00{:}48{:}44.876 \dashrightarrow 00{:}48{:}47.522$  utero effects an it's clear now that

NOTE Confidence: 0.8429239

 $00:48:47.522 \rightarrow 00:48:50.220$  these affect start very early in life,

 $00:48:50.220 \longrightarrow 00:48:52.125$  as evidenced by survival rates

NOTE Confidence: 0.8429239

 $00:48:52.125 \longrightarrow 00:48:53.649$  and persist until adulthood,

NOTE Confidence: 0.8429239

 $00:48:53.650 \longrightarrow 00:48:55.170$  as evidenced by social rank.

NOTE Confidence: 0.87613845

 $00{:}48{:}58{.}120 \dashrightarrow 00{:}49{:}00{.}970$  So these first findings on intergenerational

NOTE Confidence: 0.87613845

 $00{:}49{:}00{.}970 \dashrightarrow 00{:}49{:}03{.}531$  effects of early advantage have

NOTE Confidence: 0.87613845

 $00{:}49{:}03{.}531 \dashrightarrow 00{:}49{:}05{.}289$  really important implications.

NOTE Confidence: 0.87613845

 $00:49:05.290 \rightarrow 00:49:08.573$  There is strong importance to ensure that

NOTE Confidence: 0.87613845

00:49:08.573 --> 00:49:11.430 all children experience secure attachments,

NOTE Confidence: 0.87613845

 $00{:}49{:}11{.}430 \dashrightarrow 00{:}49{:}13{.}938$  particularly children who start

NOTE Confidence: 0.87613845

 $00:49:13.938 \longrightarrow 00:49:17.073$  out life in with disadvantage.

NOTE Confidence: 0.87613845

 $00{:}49{:}17.080 \dashrightarrow 00{:}49{:}19.295$  These findings also really underscore

NOTE Confidence: 0.87613845

 $00:49:19.295 \rightarrow 00:49:21.953$  the need for investments into parents NOTE Confidence: 0.87613845

 $00{:}49{:}21{.}953 \dashrightarrow 00{:}49{:}24{.}585$  and families not just into children or

NOTE Confidence: 0.87613845

 $00:49:24.585 \rightarrow 00:49:27.128$  infants so that families can engage

NOTE Confidence: 0.87613845

00:49:27.128 --> 00:49:29.273 in forming secure attachments with

NOTE Confidence: 0.87613845

 $00:49:29.273 \rightarrow 00:49:31.815$  their children and when parents and

- NOTE Confidence: 0.87613845
- 00:49:31.815 --> 00:49:33.920 caregivers and families are denied,

 $00{:}49{:}33{.}920 \dashrightarrow 00{:}49{:}36{.}968$  denied. Access to.

NOTE Confidence: 0.87613845

 $00:49:36.968 \longrightarrow 00:49:39.563$  Abilities to enable them to

NOTE Confidence: 0.87613845

 $00:49:39.563 \longrightarrow 00:49:41.790$  meet their basic needs,

NOTE Confidence: 0.87613845

 $00:49:41.790 \longrightarrow 00:49:43.705$  they just don't have the

NOTE Confidence: 0.87613845

 $00:49:43.705 \rightarrow 00:49:45.620$  resources to Additionally be able

NOTE Confidence: 0.87613845

 $00:49:45.688 \longrightarrow 00:49:47.338$  to form the secure bonds.

NOTE Confidence: 0.87613845

 $00:49:47.340 \longrightarrow 00:49:48.820$  So when they're denied

NOTE Confidence: 0.87613845

 $00:49:48.820 \longrightarrow 00:49:50.300$  extended paid parental leave,

NOTE Confidence: 0.87613845

 $00:49:50.300 \longrightarrow 00:49:52.442$  both mothers and fathers when they

NOTE Confidence: 0.87613845

 $00{:}49{:}52{.}442 \dashrightarrow 00{:}49{:}55{.}063$  don't have access to high quality early

NOTE Confidence: 0.87613845

 $00:49:55.063 \rightarrow 00:49:57.695$  childhood education an also by the way,

NOTE Confidence: 0.87613845

 $00:49:57.700 \longrightarrow 00:49:59.624$  when early educators are

NOTE Confidence: 0.87613845

 $00:49:59.624 \longrightarrow 00:50:01.067$  not paid appropriately.

NOTE Confidence: 0.87613845

 $00:50:01.070 \rightarrow 00:50:03.074$  When people don't have a living

 $00:50:03.074 \rightarrow 00:50:05.149$  wage and when they lack food,

NOTE Confidence: 0.87613845

 $00{:}50{:}05{.}150 \dashrightarrow 00{:}50{:}06{.}458$  housing and health security,

NOTE Confidence: 0.87613845

 $00:50:06.458 \longrightarrow 00:50:09.487$  you can begin to see how it could be

NOTE Confidence: 0.87613845

 $00{:}50{:}09{.}487 \dashrightarrow 00{:}50{:}11{.}485$  much harder to invest the resources

NOTE Confidence: 0.87613845

 $00:50:11.485 \longrightarrow 00:50:13.618$  needed in forming secure attachments that

NOTE Confidence: 0.87613845

 $00:50:13.618 \rightarrow 00:50:17.999$  those of us with more privileged means have.

NOTE Confidence: 0.87613845

 $00:50:18.000 \longrightarrow 00:50:19.134$  So what's next?

NOTE Confidence: 0.87613845

00:50:19.134 --> 00:50:19.512 Well,

NOTE Confidence: 0.87613845

 $00{:}50{:}19{.}512 \dashrightarrow 00{:}50{:}21{.}402$  with current and future funding,

NOTE Confidence: 0.87613845

 $00:50:21.410 \longrightarrow 00:50:23.684$  we aim to identify the biological

NOTE Confidence: 0.87613845

 $00{:}50{:}23.684 \dashrightarrow 00{:}50{:}25.200$  mechanisms of secure attachments.

NOTE Confidence: 0.87613845

 $00:50:25.200 \longrightarrow 00:50:27.100$  At least some of them,

NOTE Confidence: 0.87613845

 $00{:}50{:}27{.}100 \dashrightarrow 00{:}50{:}29{.}543$  and so with this current NSF funding

NOTE Confidence: 0.87613845

 $00{:}50{:}29{.}543 \dashrightarrow 00{:}50{:}31{.}475$  in collaboration with Michael Kobor

NOTE Confidence: 0.87613845

00:50:31.475 --> 00:50:33.535 at University of British Columbia,

NOTE Confidence: 0.87613845

 $00:50:33.540 \longrightarrow 00:50:35.808$  we're going to look at DNA

 $00:50:35.808 \rightarrow 00:50:36.942$  metalation across generations.

NOTE Confidence: 0.87613845

 $00{:}50{:}36{.}950 \dashrightarrow 00{:}50{:}39{.}176$  As one of these under the skin

NOTE Confidence: 0.87613845

00:50:39.176 --> 00:50:41.643 mechanisms an we're also going to begin

NOTE Confidence: 0.87613845

 $00:50:41.643 \rightarrow 00:50:43.815$  probing in inflammation both within a

NOTE Confidence: 0.87613845

00:50:43.885 --> 00:50:46.430 single generation an across generations,

NOTE Confidence: 0.87613845

 $00{:}50{:}46{.}430 \dashrightarrow 00{:}50{:}49{.}010$  and I've just recently been awarded.

NOTE Confidence: 0.87613845

 $00{:}50{:}49{.}010$  -->  $00{:}50{:}50{.}900$  This pilot award from the animal

NOTE Confidence: 0.87613845

 $00{:}50{:}50{.}900 \dashrightarrow 00{:}50{:}53{.}025$  models for the social dimensions of

NOTE Confidence: 0.87613845

 $00{:}50{:}53.025 \dashrightarrow 00{:}50{:}55.025$  health and Aging Research Network,

NOTE Confidence: 0.87613845

 $00{:}50{:}55{.}030 \dashrightarrow 00{:}50{:}56{.}795$  which is a National Institute

NOTE Confidence: 0.87613845

 $00{:}50{:}56{.}795 \dashrightarrow 00{:}50{:}58{.}207$  of Aging Research Network,

NOTE Confidence: 0.87613845

 $00{:}50{:}58{.}210 \dashrightarrow 00{:}51{:}00{.}262$  to start looking at a chronic

NOTE Confidence: 0.87613845

 $00{:}51{:}00{.}262 \dashrightarrow 00{:}51{:}02{.}110$  inflammation across the life course,

NOTE Confidence: 0.87613845

 $00{:}51{:}02{.}110 \dashrightarrow 00{:}51{:}04{.}612$  and I plan in the next few months to

NOTE Confidence: 0.87613845

 $00{:}51{:}04{.}612 \dashrightarrow 00{:}51{:}07{.}048$  apply for further funding from the

 $00:51:07.048 \rightarrow 00:51:09.540$  foundations and institutes you see here,

NOTE Confidence: 0.87613845

 $00{:}51{:}09{.}540 \dashrightarrow 00{:}51{:}10{.}602$  including one opportunity.

NOTE Confidence: 0.87613845

 $00:51:10.602 \longrightarrow 00:51:12.018$  I'm really excited about.

NOTE Confidence: 0.87613845

 $00{:}51{:}12.020 \dashrightarrow 00{:}51{:}13.253$  Again from NIH.

NOTE Confidence: 0.87613845

 $00:51:13.253 \rightarrow 00:51:15.308$  It's for early stage investigators

NOTE Confidence: 0.87613845

 $00:51:15.308 \dashrightarrow 00:51:17.150$  using nonhuman primate models.

NOTE Confidence: 0.87613845

00:51:17.150 --> 00:51:20.230 And in addition to these two DNA,

NOTE Confidence: 0.87613845

 $00{:}51{:}20{.}230 \dashrightarrow 00{:}51{:}21{.}823$  metalation information will

NOTE Confidence: 0.87613845

 $00{:}51{:}21{.}823 \dashrightarrow 00{:}51{:}24{.}478$  obviously also be probing for

NOTE Confidence: 0.87613845

 $00:51:24.478 \dashrightarrow 00:51:26.410$  other biological mechanisms.

NOTE Confidence: 0.87613845

 $00{:}51{:}26{.}410$  -->  $00{:}51{:}29{.}164$  I also want to take a moment to talk NOTE Confidence: 0.87613845

 $00{:}51{:}29{.}164 \dashrightarrow 00{:}51{:}31{.}660$  about how we're expanding our hair.

NOTE Confidence: 0.87613845

 $00{:}51{:}31.660 \dashrightarrow 00{:}51{:}33.940$  Cortisol or chronic stress studies

NOTE Confidence: 0.87613845

00:51:33.940 --> 00:51:36.512 so we're acquiring equipment now to

NOTE Confidence: 0.87613845

 $00:51:36.512 \longrightarrow 00:51:38.959$  set up a lab to be able to run her

NOTE Confidence: 0.87613845

 $00:51:38.959 \rightarrow 00:51:41.458$  cortisol assays here in house at Yale,

- NOTE Confidence: 0.87613845
- $00:51:41.460 \longrightarrow 00:51:43.265$  and I'm really bummed because
- NOTE Confidence: 0.87613845
- $00{:}51{:}43.265 \dashrightarrow 00{:}51{:}45.464$  right before Pandemic hit and we
- NOTE Confidence: 0.87613845
- 00:51:45.464 --> 00:51:47.408 were required to go into lockdown,
- NOTE Confidence: 0.87613845
- 00:51:47.410 --> 00:51:49.426 I was just preparing an IRB protocol
- NOTE Confidence: 0.87613845
- $00{:}51{:}49{.}426 \dashrightarrow 00{:}51{:}51{.}643$  to study with a colleague and
- NOTE Confidence: 0.87613845
- 00:51:51.643 --> 00:51:53.359 collaborator University of Virginia.
- NOTE Confidence: 0.87613845
- $00:51:53.360 \rightarrow 00:51:55.388$  A different type of early life
- NOTE Confidence: 0.87613845
- $00:51:55.388 \dashrightarrow 00:51:57.380$  experience and that is bearable.
- NOTE Confidence: 0.87613845
- 00:51:57.380 --> 00:51:58.270 Educational environments,
- NOTE Confidence: 0.87613845
- $00:51:58.270 \longrightarrow 00:52:01.385$  so we're going to compare a children
- NOTE Confidence: 0.87613845
- 00:52:01.385 --> 00:52:03.569 in public Montessori schools
- NOTE Confidence: 0.87613845
- $00{:}52{:}03{.}569 \dashrightarrow 00{:}52{:}05{.}797$  with standard public education.
- NOTE Confidence: 0.87613845
- $00{:}52{:}05{.}800 \dashrightarrow 00{:}52{:}07{.}949$  Pedagogy and look at see how their
- NOTE Confidence: 0.87613845
- $00{:}52{:}07{.}949 \dashrightarrow 00{:}52{:}09{.}582$  hair cortisol change across the
- NOTE Confidence: 0.87613845
- $00{:}52{:}09{.}582 \dashrightarrow 00{:}52{:}11{.}526$  year and how that influenced their
- NOTE Confidence: 0.87613845

00:52:11.526 --> 00:52:13.690 academic and social emotional outcomes. NOTE Confidence: 0.87613845  $00:52:13.690 \longrightarrow 00:52:15.608$  So we hope to resume this once NOTE Confidence: 0.87613845  $00{:}52{:}15{.}608 \dashrightarrow 00{:}52{:}18{.}147$  it's safe to do so with additional NOTE Confidence: 0.87613845 00:52:18.147 --> 00:52:20.202 colleagues at University of Chicago, NOTE Confidence: 0.8342103  $00:52:20.210 \rightarrow 00:52:22.256$  we just submitted a research grant, NOTE Confidence: 0.8342103  $00:52:22.260 \rightarrow 00:52:24.605$  a small pilot award to look at NOTE Confidence: 0.8342103  $00:52:24.605 \rightarrow 00:52:26.838$  the hair cortisol of black mothers NOTE Confidence: 0.8342103  $00{:}52{:}26.838$  -->  $00{:}52{:}29.142$  whose prenatal and post Natal care NOTE Confidence: 0.8342103  $00{:}52{:}29{.}142 \dashrightarrow 00{:}52{:}31{.}557$  has been disrupted due to covid. NOTE Confidence: 0.8342103  $00:52:31.560 \rightarrow 00:52:33.525$  And with colleagues here at NOTE Confidence: 0.8342103 00:52:33.525 --> 00:52:35.490 the Yale School of Nursing, NOTE Confidence: 0.8342103  $00:52:35.490 \longrightarrow 00:52:37.848$  we're about to submit a grant NOTE Confidence: 0.8342103 00:52:37.848 --> 00:52:39.824 to the National Heart, Lung, NOTE Confidence: 0.8342103 00:52:39.824 --> 00:52:41.844 and Blood Institute to examine NOTE Confidence: 0.8342103 00:52:41.844 --> 00:52:43.740 how chronic stress may be, NOTE Confidence: 0.8342103  $00:52:43.740 \longrightarrow 00:52:46.180$  what role it may have in a sleep

- NOTE Confidence: 0.8342103
- $00:52:46.180 \longrightarrow 00:52:48.459$  disorders and cardiovascular function.

 $00:52:48.460 \longrightarrow 00:52:50.425$  But one could also envision

NOTE Confidence: 0.8342103

 $00:52:50.425 \rightarrow 00:52:52.390$  studying other hormones in her.

NOTE Confidence: 0.8342103

 $00:52:52.390 \longrightarrow 00:52:53.962$  It's possible to measure,

NOTE Confidence: 0.8342103

 $00:52:53.962 \longrightarrow 00:52:55.172$  for example, progesterone,

NOTE Confidence: 0.8342103

 $00:52:55.172 \rightarrow 00:52:56.438$  estradiol and testosterone,

NOTE Confidence: 0.8342103

 $00:52:56.438 \rightarrow 00:52:59.748$  and maybe some of you have an interest

NOTE Confidence: 0.8342103

 $00:52:59.748 \rightarrow 00:53:01.890$  in studying other elements in her.

NOTE Confidence: 0.8342103

 $00{:}53{:}01{.}890 \dashrightarrow 00{:}53{:}03{.}286$  That might measure environmental

NOTE Confidence: 0.8342103

 $00:53:03.286 \rightarrow 00:53:05.031$  exposures like trace elements or

NOTE Confidence: 0.8342103

 $00{:}53{:}05{.}031 \dashrightarrow 00{:}53{:}06{.}760$  heavy metals or to bacco exposure.

NOTE Confidence: 0.8342103

 $00{:}53{:}06{.}760 \dashrightarrow 00{:}53{:}09{.}883$  So if any of these sound interesting to you,

NOTE Confidence: 0.8342103

 $00:53:09.890 \rightarrow 00:53:13.022$  please get in touch with me after the talk.

NOTE Confidence: 0.859246550000001

 $00{:}53{:}15{.}170 \dashrightarrow 00{:}53{:}17{.}218$  And so with that I would like to

NOTE Confidence: 0.859246550000001

 $00{:}53{:}17{.}218$  -->  $00{:}53{:}18{.}861$  conclude by acknowledging our funders

 $00:53:18.861 \rightarrow 00:53:21.346$  have made all of this work possible

NOTE Confidence: 0.859246550000001

 $00{:}53{:}21{.}413 \dashrightarrow 00{:}53{:}23{.}279$  today that I've shared with you,

NOTE Confidence: 0.859246550000001

 $00{:}53{:}23{.}280 \dashrightarrow 00{:}53{:}25{.}457$  along with the numerous people who work NOTE Confidence: 0.859246550000001

 $00:53:25.457 \rightarrow 00:53:27.648$  behind the scenes to present these data.

NOTE Confidence: 0.859246550000001

 $00{:}53{:}27.650 \dashrightarrow 00{:}53{:}30.251$  And I would be remiss if I did not

NOTE Confidence: 0.859246550000001

 $00{:}53{:}30{.}251 \dashrightarrow 00{:}53{:}32{.}047$ acknowledge my own caregivers who gave NOTE Confidence: 0.859246550000001

 $00{:}53{:}32.047 \dashrightarrow 00{:}53{:}34.245$  me the best form of secure attachment

NOTE Confidence: 0.859246550000001

 $00{:}53{:}34{.}245 \dashrightarrow 00{:}53{:}37{.}005$  from the moment I was born two months

NOTE Confidence: 0.859246550000001

00:53:37.010 -> 00:53:39.482 early as a preemie who could fit in

NOTE Confidence: 0.859246550000001

 $00:53:39.482 \rightarrow 00:53:42.310$  a shoe box all the way up until now.

NOTE Confidence: 0.859246550000001

 $00:53:42.310 \longrightarrow 00:53:44.459$  Not only do they provide me with

NOTE Confidence: 0.859246550000001

 $00:53:44.459 \longrightarrow 00:53:46.088$  the secure loving base, but.

NOTE Confidence: 0.859246550000001

 $00{:}53{:}46.088 \dashrightarrow 00{:}53{:}47.440$  Pretty good peer interactions

NOTE Confidence: 0.859246550000001

 $00:53:47.440 \longrightarrow 00:53:48.792$  with my sister too.

NOTE Confidence: 0.859246550000001

 $00{:}53{:}48{.}800 \dashrightarrow 00{:}53{:}51{.}256$  So with that I'm going to leave you

NOTE Confidence: 0.859246550000001

 $00:53:51.256 \rightarrow 00:53:53.829$  with one more quote by Harry Harlow,

- NOTE Confidence: 0.859246550000001
- $00:53:53.830 \rightarrow 00:53:57.407$  perhaps, and in which he was describing.
- NOTE Confidence: 0.859246550000001
- $00{:}53{:}57{.}410 \dashrightarrow 00{:}54{:}00{.}175$  An an ecdotal behavior he had seen where
- NOTE Confidence: 0.859246550000001
- $00{:}54{:}00{.}175 \dashrightarrow 00{:}54{:}02{.}928$  a monkey used a stick as a weapon.
- NOTE Confidence: 0.859246550000001
- $00:54:02.930 \rightarrow 00:54:04.724$  Perhaps we should be criticized for
- NOTE Confidence: 0.859246550000001
- $00:54:04.724 \rightarrow 00:54:06.340$  not reporting these behaviors earlier,
- NOTE Confidence: 0.859246550000001
- $00:54:06.340 \longrightarrow 00:54:07.568$  but in my defense,
- NOTE Confidence: 0.859246550000001
- $00:54:07.568 \rightarrow 00:54:10.060$  let me state that in the mid 30s,
- NOTE Confidence: 0.859246550000001
- $00:54:10.060 \rightarrow 00:54:11.364$  comparative psychology had attained
- NOTE Confidence: 0.859246550000001
- $00{:}54{:}11{.}364 \dashrightarrow 00{:}54{:}13{.}320$  a level of objectivity that made
- NOTE Confidence: 0.859246550000001
- 00:54:13.370 00:54:14.640 reporting such behavior a matter
- NOTE Confidence: 0.859246550000001
- $00:54:14.640 \longrightarrow 00:54:16.320$  of grave risk to the reputation
- NOTE Confidence: 0.859246550000001
- $00:54:16.320 \dashrightarrow 00:54:18.115$  of any ambitious young scientists.
- NOTE Confidence: 0.859246550000001
- $00{:}54{:}18{.}120 \dashrightarrow 00{:}54{:}21{.}109$  And it is better to become famous
- NOTE Confidence: 0.859246550000001
- $00:54:21.109 \rightarrow 00:54:24.346$  slowly than to be right all at once.
- NOTE Confidence: 0.859246550000001
- $00{:}54{:}24{.}350 \dashrightarrow 00{:}54{:}26{.}310$  Alright, so that is it.
- NOTE Confidence: 0.859246550000001

00:54:26.310 --> 00:54:28.788 Thank you very much all for being

NOTE Confidence: 0.859246550000001

 $00:54:28.788 \rightarrow 00:54:31.779$  here and and especially for you know,

NOTE Confidence: 0.859246550000001

00:54:31.780 - 00:54:34.433 enlightening me in here and let me

NOTE Confidence: 0.859246550000001

 $00:54:34.433 \rightarrow 00:54:36.859$  regale you with my monkey tails.

NOTE Confidence: 0.859246550000001

 $00{:}54{:}36{.}860 \dashrightarrow 00{:}54{:}41{.}868$  So thank you. Amanda, thank you so much.

NOTE Confidence: 0.859246550000001

 $00{:}54{:}41{.}870 \dashrightarrow 00{:}54{:}43{.}220$  We are out of time,

NOTE Confidence: 0.859246550000001

 $00{:}54{:}43{.}220 \dashrightarrow 00{:}54{:}45{.}092$  but we're going to leave them open and

NOTE Confidence: 0.859246550000001

 $00{:}54{:}45{.}092 \dashrightarrow 00{:}54{:}46{.}869$  I'll stick around and whomever wants

NOTE Confidence: 0.859246550000001

 $00:54:46.869 \rightarrow 00:54:48.444$  to stick around Papparazi's questions

NOTE Confidence: 0.859246550000001

 $00:54:48.444 \rightarrow 00:54:50.172$  if you need to leave, that's fine.

NOTE Confidence: 0.859246550000001

 $00{:}54{:}50{.}172 \dashrightarrow 00{:}54{:}52{.}630$  If you want to stay hang out but Amanda,

NOTE Confidence: 0.859246550000001

 $00:54:52.630 \longrightarrow 00:54:54.506$  thank you. I will be so much.

NOTE Confidence: 0.859246550000001

00:54:54.510 --> 00:54:54.788 Yes,

NOTE Confidence: 0.859246550000001

 $00{:}54{:}54{.}788 \dashrightarrow 00{:}54{:}57{.}012$  thank you so much for the invitation on

NOTE Confidence: 0.859246550000001

 $00{:}54{:}57{.}012 \dashrightarrow 00{:}54{:}59{.}345$  race and I really hope to see as many of

NOTE Confidence: 0.859246550000001

 $00{:}54{:}59{.}345 \dashrightarrow 00{:}55{:}01{.}510$  you as possible in person again soon.

NOTE Confidence: 0.859246550000001 00:55:01.510 --> 00:55:02.208 Thank you.