WEBVTT

NOTE duration:"01:06:35"

NOTE recognizability:0.855

NOTE language:en-us

NOTE Confidence: 0.911157192857143

00:00:00.000 --> 00:00:03.927 Great, so there's still people coming in,

NOTE Confidence: 0.911157192857143

00:00:03.930 --> 00:00:06.648 but we might just make a start and so

NOTE Confidence: 0.911157192857143

00:00:06.648 --> 00:00:09.143 good afternoon everyone and welcome to

NOTE Confidence: 0.911157192857143

00:00:09.143 --> 00:00:12.100 grand rounds at the Child Study Center

NOTE Confidence: 0.911157192857143

00:00:12.100 --> 00:00:14.767 and I'd like to start by thanking

NOTE Confidence: 0.911157192857143

00:00:14.767 --> 00:00:17.480 Doctor Linda Mays for kicking off

NOTE Confidence: 0.911157192857143

00:00:17.480 --> 00:00:20.510 our 2022 lecture series last week.

NOTE Confidence: 0.911157192857143

00:00:20.510 --> 00:00:22.286 And you know, one of the themes that

NOTE Confidence: 0.911157192857143

00:00:22.286 --> 00:00:23.470 emerged from Linda's presentation

NOTE Confidence: 0.911157192857143

00:00:23.470 --> 00:00:25.190 was the importance of community,

NOTE Confidence: 0.911157192857143

00:00:25.190 --> 00:00:26.940 so it's so heartening to see you

NOTE Confidence: 0.911157192857143

00:00:26.940 --> 00:00:29.350 all on the call today as we continue

NOTE Confidence: 0.911157192857143

00:00:29.350 --> 00:00:30.950 with our grand rounds series.

NOTE Confidence: 0.911157192857143

00:00:30.950 --> 00:00:32.816 Now just a couple of notices,

NOTE Confidence: 0.911157192857143

00:00:32.820 --> 00:00:35.039 and next week we'll hear from Usha

NOTE Confidence: 0.911157192857143

00:00:35.039 --> 00:00:36.845 Tummala Narra and from Boston

NOTE Confidence: 0.911157192857143

00:00:36.845 --> 00:00:38.810 College after Russia to molinara,

NOTE Confidence: 0.911157192857143

00:00:38.810 --> 00:00:41.540 they'll be speaking to us about a

NOTE Confidence: 0.911157192857143

00:00:41.540 --> 00:00:43.094 psycho analytical perspective on

NOTE Confidence: 0.911157192857143

00:00:43.094 --> 00:00:45.020 the origins of xenophobia and racism

NOTE Confidence: 0.911157192857143

00:00:45.020 --> 00:00:47.464 and how such xenophobia and racism

NOTE Confidence: 0.911157192857143

00:00:47.464 --> 00:00:49.814 contributes in perpetuates suffering and

NOTE Confidence: 0.911157192857143

00:00:49.814 --> 00:00:51.789 trauma within racial minority immigrants.

NOTE Confidence: 0.911157192857143

00:00:51.789 --> 00:00:54.190 Here in the United States and now

NOTE Confidence: 0.911157192857143

00:00:54.255 --> 00:00:56.181 rounding off our speaker series in

NOTE Confidence: 0.911157192857143

00:00:56.181 --> 00:00:57.900 January will be Doctor Jonathan

NOTE Confidence: 0.911157192857143

00:00:57.900 --> 00:00:59.775 Omer Hearty from Kings College.

NOTE Confidence: 0.911157192857143

00:00:59.780 --> 00:01:02.034 London will be sharing some new data.

NOTE Confidence: 0.911157192857143

00:01:02.040 --> 00:01:04.476 From the developing Human Connectome project,

NOTE Confidence: 0.911157192857143

00:01:04.480 --> 00:01:06.980 and really emphasizing the importance

NOTE Confidence: 0.911157192857143

00:01:06.980 --> 00:01:09.480 of studying individual trajectories of

NOTE Confidence: 0.911157192857143

00:01:09.548 --> 00:01:11.618 brain development from the prenatal

NOTE Confidence: 0.911157192857143

00:01:11.618 --> 00:01:14.392 period across early life to better

NOTE Confidence: 0.911157192857143

00:01:14.392 --> 00:01:16.916 understand braydan behavior associations.

NOTE Confidence: 0.911157192857143

00:01:16.920 --> 00:01:19.494 Now today it's my distinct privilege

NOTE Confidence: 0.911157192857143

00:01:19.494 --> 00:01:21.755 and pleasure to introduce Doctor

NOTE Confidence: 0.911157192857143

00:01:21.755 --> 00:01:24.120 Jenny Tongue from Duke University.

NOTE Confidence: 0.911157192857143

00:01:24.120 --> 00:01:25.760 I'd like to especially thank

NOTE Confidence: 0.911157192857143

00:01:25.760 --> 00:01:27.400 Jenny for being so flexible.

NOTE Confidence: 0.911157192857143

00:01:27.400 --> 00:01:30.368 We really reschedule this to be a virtual

NOTE Confidence: 0.911157192857143

00:01:30.368 --> 00:01:32.827 format and with very short notice.

NOTE Confidence: 0.911157192857143

00:01:32.830 --> 00:01:33.871 So thank you,

NOTE Confidence: 0.911157192857143

00:01:33.871 --> 00:01:34.218 Jennifer,

NOTE Confidence: 0.911157192857143

00:01:34.218 --> 00:01:37.749 for being with us today and as you'll hear

NOTE Confidence: 0.911157192857143

00:01:37.749 --> 00:01:40.044 from Doctor Tongues presentation today,

NOTE Confidence: 0.911157192857143

00:01:40.050 --> 00:01:42.435 the Tongue Group seamlessly integrates

NOTE Confidence: 0.911157192857143

00:01:42.435 --> 00:01:44.343 functional genomics with behavioral

NOTE Confidence: 0.911157192857143

00:01:44.343 --> 00:01:46.691 ecology to really ask and answer

NOTE Confidence: 0.911157192857143

00:01:46.691 --> 00:01:48.135 questions of importance regarding

NOTE Confidence: 0.911157192857143

00:01:48.135 --> 00:01:50.257 how the social environment and

NOTE Confidence: 0.911157192857143

00:01:50.257 --> 00:01:51.957 social stress shapes individual

NOTE Confidence: 0.911157192857143

00:01:51.957 --> 00:01:54.138 differences in a range of phenotypes,

NOTE Confidence: 0.911157192857143

00:01:54.138 --> 00:01:56.130 and then how those changes in

NOTE Confidence: 0.911157192857143

00:01:56.197 --> 00:01:58.017 behavior can change the function

NOTE Confidence: 0.911157192857143

00:01:58.017 --> 00:02:00.350 and the evolution of the genome.

NOTE Confidence: 0.911157192857143

00:02:00.350 --> 00:02:00.653 Now,

NOTE Confidence: 0.911157192857143

00:02:00.653 --> 00:02:02.168 Doctor Tung's work has been

NOTE Confidence: 0.911157192857143

00:02:02.168 --> 00:02:03.840 the impact of doctor Tongue.

NOTE Confidence: 0.911157192857143

00:02:03.840 --> 00:02:05.940 Work has been recognized by a number

NOTE Confidence: 0.911157192857143

00:02:05.940 --> 00:02:07.580 of different funding institutions,

NOTE Confidence: 0.911157192857143

00:02:07.580 --> 00:02:08.873 agencies, and foundations,

NOTE Confidence: 0.911157192857143

00:02:08.873 --> 00:02:10.597 including the MacArthur Foundation,

NOTE Confidence: 0.911157192857143

00:02:10.600 --> 00:02:12.958 that named Jenny MacArthur Fellow in

NOTE Confidence: 0.911157192857143

00:02:12.960 --> 00:02:14.992 2019 and which I think was the same

NOTE Confidence: 0.911157192857143

00:02:14.992 --> 00:02:17.356 year that you renamed as a fellow in

NOTE Confidence: 0.911157192857143

00:02:17.356 --> 00:02:19.052 the Canadian Institute for Advanced

NOTE Confidence: 0.911157192857143

00:02:19.052 --> 00:02:21.668 Research Child and Brain Development Program.

NOTE Confidence: 0.911157192857143

00:02:21.670 --> 00:02:23.374 Now it's at this stage that I really

NOTE Confidence: 0.911157192857143

00:02:23.374 --> 00:02:25.245 wish that I had some canned laugh or

NOTE Confidence: 0.911157192857143

00:02:25.245 --> 00:02:26.720 some canned applause to like welcome

NOTE Confidence: 0.911157192857143

00:02:26.720 --> 00:02:28.214 you to the Child Study Center.

NOTE Confidence: 0.911157192857143

00:02:28.220 --> 00:02:30.390 We're getting some virtual applause

NOTE Confidence: 0.911157192857143

00:02:30.390 --> 00:02:31.560 in on zoom,

NOTE Confidence: 0.911157192857143

00:02:31.560 --> 00:02:32.340 but really,

NOTE Confidence: 0.911157192857143

00:02:32.340 --> 00:02:33.985 it's a pleasure to have you with.

NOTE Confidence: 0.911157192857143

00:02:33.990 --> 00:02:36.886 Today and welcome to the CHILD Study Center.

NOTE Confidence: 0.871134628

00:02:39.520 --> 00:02:40.840 Thank you so much Karen.

NOTE Confidence: 0.871134628

00:02:40.840 --> 00:02:42.528 Thanks to all of you for for being

NOTE Confidence: 0.871134628

00:02:42.528 --> 00:02:44.122 willing to carve out time in your

NOTE Confidence: 0.871134628

00:02:44.122 --> 00:02:45.670 day to do another virtual seminar,

NOTE Confidence: 0.871134628

00:02:45.670 --> 00:02:48.220 and especially to Karen and Rosemary

NOTE Confidence: 0.871134628

00:02:48.220 --> 00:02:50.691 for being so flexible and making

NOTE Confidence: 0.871134628

00:02:50.691 --> 00:02:53.106 this thing work as we go through

NOTE Confidence: 0.871134628

00:02:53.106 --> 00:02:55.852 the sort of whiplash of wave for

NOTE Confidence: 0.871134628

00:02:55.852 --> 00:02:59.030 whatever we happen to be on.

NOTE Confidence: 0.871134628

00:02:59.030 --> 00:03:01.088 OK, can you guys see my screen?

NOTE Confidence: 0.871134628

00:03:01.090 --> 00:03:02.580 OK, does this look like

NOTE Confidence: 0.871134628

00:03:02.580 --> 00:03:04.070 it's it's supposed to look?

NOTE Confidence: 0.871134628

00:03:04.070 --> 00:03:05.720 This is great alright.

NOTE Confidence: 0.871134628

00:03:05.720 --> 00:03:07.190 As Karen mentioned,

NOTE Confidence: 0.871134628

00:03:07.190 --> 00:03:10.130 my focal system is largely non

NOTE Confidence: 0.871134628

00:03:10.222 --> 00:03:11.470 human primates.

NOTE Confidence: 0.871134628

00:03:11.470 --> 00:03:13.388 I do some work on other social

NOTE Confidence: 0.871134628

00:03:13.388 --> 00:03:15.131 mammals but by and large not

NOTE Confidence: 0.871134628

00:03:15.131 --> 00:03:17.133 humans which I suspect is the the

NOTE Confidence: 0.871134628

00:03:17.199 --> 00:03:19.208 study system of most of you here.

NOTE Confidence: 0.871134628

00:03:19.210 --> 00:03:22.486 So I'm going to just start my

NOTE Confidence: 0.871134628

00:03:22.486 --> 00:03:24.334 presentation by introducing you

NOTE Confidence: 0.871134628

00:03:24.334 --> 00:03:26.847 to a few of our study subjects.

NOTE Confidence: 0.871134628

00:03:26.850 --> 00:03:29.580 The animals in my title slide are.

NOTE Confidence: 0.871134628

00:03:29.580 --> 00:03:30.762 Two known females.

NOTE Confidence: 0.871134628

00:03:30.762 --> 00:03:33.126 This is Rwanda on the bottom

NOTE Confidence: 0.871134628

00:03:33.126 --> 00:03:35.178 right and her then adolescent

NOTE Confidence: 0.871134628

00:03:35.178 --> 00:03:37.542 daughter rodeo up on the top.

NOTE Confidence: 0.871134628

00:03:37.550 --> 00:03:39.370 I'm showing you these particular

NOTE Confidence: 0.871134628

00:03:39.370 --> 00:03:41.675 individuals because they are the benefits

NOTE Confidence: 0.871134628

00:03:41.675 --> 00:03:43.780 of substantial amounts of privilege.

NOTE Confidence: 0.871134628

00:03:43.780 --> 00:03:45.802 At least what counts is privilege

NOTE Confidence: 0.871134628

00:03:45.802 --> 00:03:47.760 in a wild baboon society,

NOTE Confidence: 0.871134628

00:03:47.760 --> 00:03:49.926 Rwanda was born to a particularly

NOTE Confidence: 0.871134628

00:03:49.926 --> 00:03:51.829 high status female and because

NOTE Confidence: 0.871134628

00:03:51.829 --> 00:03:53.377 in species like these,

NOTE Confidence: 0.871134628

00:03:53.380 --> 00:03:55.400 females inherit their social status,

NOTE Confidence: 0.871134628

00:03:55.400 --> 00:03:57.661 their position on the on the social

NOTE Confidence: 0.871134628

00:03:57.661 --> 00:04:00.760 hierarchy from their mothers, she's.

NOTE Confidence: 0.871134628

00:04:00.760 --> 00:04:03.030 Tire life.

NOTE Confidence: 0.871134628

00:04:03.030 --> 00:04:05.445 As either the top ranking female and

NOTE Confidence: 0.871134628

00:04:05.445 --> 00:04:07.806 her social group or just right below

NOTE Confidence: 0.871134628

00:04:07.806 --> 00:04:10.215 that that's had some pretty profound

NOTE Confidence: 0.871134628

00:04:10.215 --> 00:04:13.010 effects on on her life history.

NOTE Confidence: 0.871134628

00:04:13.010 --> 00:04:15.950 High ranking females in the population

NOTE Confidence: 0.871134628

00:04:15.950 --> 00:04:18.557 that we study reach maturation

NOTE Confidence: 0.871134628

00:04:18.557 --> 00:04:21.436 earlier and because of increased

NOTE Confidence: 0.871134628

00:04:21.436 --> 00:04:24.666 or better access to resources,

NOTE Confidence: 0.871134628

00:04:24.670 --> 00:04:26.355 they tend to have shorter

NOTE Confidence: 0.871134628

00:04:26.355 --> 00:04:28.040 inter birth intervals as well.

NOTE Confidence: 0.871134628

00:04:28.040 --> 00:04:30.260 So Rwanda has been remarkably

NOTE Confidence: 0.871134628

00:04:30.260 --> 00:04:32.036 successful at producing offspring.

NOTE Confidence: 0.871134628

00:04:32.040 --> 00:04:33.219 She's had eight.

NOTE Confidence: 0.871134628

00:04:33.219 --> 00:04:36.443 Live birth so far 2 miscarriages and her

NOTE Confidence: 0.871134628

00:04:36.443 --> 00:04:39.273 most recent offspring was born in 2020,

NOTE Confidence: 0.871134628

00:04:39.273 --> 00:04:43.057 so she was a pandemic baby and Rwanda

NOTE Confidence: 0.871134628

00:04:43.057 --> 00:04:45.895 is still going the the advantages

NOTE Confidence: 0.871134628

00:04:45.895 --> 00:04:48.520 that accrue to her have been passed

NOTE Confidence: 0.871134628

00:04:48.592 --> 00:04:50.368 down in an intergenerational

NOTE Confidence: 0.871134628

00:04:50.368 --> 00:04:53.032 fashion to her daughter Rodeo here,

NOTE Confidence: 0.871134628

00:04:53.040 --> 00:04:54.966 who benefits from having a large

NOTE Confidence: 0.871134628

00:04:54.966 --> 00:04:56.878 family including a large number of

NOTE Confidence: 0.871134628

00:04:56.878 --> 00:04:58.852 sisters who are likely to be her

NOTE Confidence: 0.871134628

00:04:58.852 --> 00:05:00.997 closest social partners throughout life.

NOTE Confidence: 0.871134628

00:05:01.000 --> 00:05:02.421 And in fact we know from previous

NOTE Confidence: 0.871134628

00:05:02.421 --> 00:05:03.350 work in our study.

NOTE Confidence: 0.871134628

00:05:03.350 --> 00:05:05.240 Population that females who have a

NOTE Confidence: 0.871134628

00:05:05.240 --> 00:05:07.204 lot of close social partners live

NOTE Confidence: 0.871134628

00:05:07.204 --> 00:05:09.130 on average years longer than those

NOTE Confidence: 0.871134628

00:05:09.130 --> 00:05:11.518 who do not see the top quartile

NOTE Confidence: 0.871134628

00:05:11.518 --> 00:05:12.866 versus the bottom quartile.

NOTE Confidence: 0.871134628

00:05:12.870 --> 00:05:15.430 Most socially integrated versus

NOTE Confidence: 0.871134628

00:05:15.430 --> 00:05:17.350 socially isolated baboons.

NOTE Confidence: 0.871134628

00:05:17.350 --> 00:05:19.990 So the circumstances of early life

NOTE Confidence: 0.871134628

00:05:19.990 --> 00:05:22.298 surrounding the birth of these

NOTE Confidence: 0.871134628

00:05:22.298 --> 00:05:24.178 animals shapes their phenotype

NOTE Confidence: 0.871134628

00:05:24.178 --> 00:05:26.528 in a long lasting fashion,

NOTE Confidence: 0.871134628

00:05:26.530 --> 00:05:29.380 parallel in some ways to what

NOTE Confidence: 0.871134628

00:05:29.380 --> 00:05:32.040 has been observed in humans.

NOTE Confidence: 0.871134628

00:05:32.040 --> 00:05:34.644 This type of the importance of early

NOTE Confidence: 0.871134628

00:05:34.644 --> 00:05:37.098 life effects I'm talking about here

NOTE Confidence: 0.871134628

00:05:37.100 --> 00:05:38.830 is something that's been observed

NOTE Confidence: 0.871134628

00:05:38.830 --> 00:05:40.214 repeatedly in other species,

NOTE Confidence: 0.871134628

00:05:40.220 --> 00:05:41.720 and in fact,

NOTE Confidence: 0.871134628

00:05:41.720 --> 00:05:44.180 in much more striking fashions that

NOTE Confidence: 0.871134628

00:05:44.180 --> 00:05:46.420 I'm even talking about in the baboons.

NOTE Confidence: 0.871134628

00:05:46.420 --> 00:05:47.340 So here in the top,

NOTE Confidence: 0.871134628

00:05:47.340 --> 00:05:49.612 I'm showing you spadefoot,

NOTE Confidence: 0.871134628

00:05:49.612 --> 00:05:52.116 toad tadpoles, water fleas,

NOTE Confidence: 0.871134628

00:05:52.116 --> 00:05:55.477 and tobacco horn worm larvae,

NOTE Confidence: 0.871134628

00:05:55.477 --> 00:05:57.358 which actually produced

NOTE Confidence: 0.871134628

00:05:57.358 --> 00:05:59.239 entirely different morphs,

NOTE Confidence: 0.65311982

00:05:59.240 --> 00:06:01.670 carnivore versus omnivore, or morphs.

NOTE Confidence: 0.65311982

00:06:01.670 --> 00:06:04.958 Of the tadpoles, can you see my cursor?

NOTE Confidence: 0.65311982

00:06:04.960 --> 00:06:07.093 Actually, I can't tell if you can see what.

NOTE Confidence: 0.65311982

00:06:07.100 --> 00:06:10.254 Yeah, OK. Great, so carnivore and

NOTE Confidence: 0.65311982

00:06:10.254 --> 00:06:12.120 omnivore or more fear is actually

NOTE Confidence: 0.65311982

00:06:12.177 --> 00:06:13.732 a carnivore eating an omnivore

NOTE Confidence: 0.65311982

00:06:13.732 --> 00:06:15.624 morph based purely on what early

NOTE Confidence: 0.65311982

00:06:15.624 --> 00:06:17.304 life diet looks like in these.

NOTE Confidence: 0.65311982

00:06:17.310 --> 00:06:19.910 In these in these toads,

NOTE Confidence: 0.65311982

00:06:19.910 --> 00:06:23.894 this elaborated helmet or long sword

NOTE Confidence: 0.65311982

00:06:23.894 --> 00:06:26.826 depending on whether eggs of Daphnia

NOTE Confidence: 0.65311982

00:06:26.826 --> 00:06:29.010 are exposed to predator cues or a

NOTE Confidence: 0.65311982

00:06:29.083 --> 00:06:31.187 completely different color morph,

NOTE Confidence: 0.65311982

00:06:31.190 --> 00:06:33.310 just depending on the temperature.

NOTE Confidence: 0.65311982

00:06:33.310 --> 00:06:34.814 In early development these

NOTE Confidence: 0.65311982

00:06:34.814 --> 00:06:37.070 are pretty far afield from us,

NOTE Confidence: 0.65311982

00:06:37.070 --> 00:06:39.919 but there are examples of fairly striking.

NOTE Confidence: 0.65311982

00:06:39.920 --> 00:06:42.584 Early life effects in other mammals as well.

NOTE Confidence: 0.65311982

00:06:42.590 --> 00:06:44.645 We know from experimental evidence

NOTE Confidence: 0.65311982

00:06:44.645 --> 00:06:47.549 that wild red squirrels who are exposed

NOTE Confidence: 0.65311982

00:06:47.549 --> 00:06:49.895 to cues of high density actually

NOTE Confidence: 0.65311982

00:06:49.895 --> 00:06:52.269 accelerate the their offspring growth.

NOTE Confidence: 0.65311982

00:06:52.270 --> 00:06:54.104 We know that voles who are born

NOTE Confidence: 0.65311982

00:06:54.104 --> 00:06:56.280 in the cold season versus a wet

NOTE Confidence: 0.65311982

00:06:56.280 --> 00:06:58.260 season develop a thicker codes and

NOTE Confidence: 0.65311982

00:06:58.321 --> 00:07:00.223 from work in the population that

NOTE Confidence: 0.65311982

00:07:00.223 --> 00:07:02.158 I'll be telling you about today.

NOTE Confidence: 0.65311982

00:07:02.158 --> 00:07:04.461 These baboons we know that diet in

NOTE Confidence: 0.65311982

00:07:04.461 --> 00:07:06.796 the first year of life postnatally

NOTE Confidence: 0.65311982

00:07:06.800 --> 00:07:08.978 has effects on the overall lifetime

NOTE Confidence: 0.65311982

00:07:08.978 --> 00:07:10.430 reproductive success of these.

NOTE Confidence: 0.65311982

00:07:10.430 --> 00:07:13.898 Animals, even years or decades later.

NOTE Confidence: 0.65311982

00:07:13.900 --> 00:07:14.827 And of course,

NOTE Confidence: 0.65311982

00:07:14.827 --> 00:07:16.681 in our own species there's been

NOTE Confidence: 0.65311982

00:07:16.681 --> 00:07:18.344 abundant work linking childhood

NOTE Confidence: 0.65311982

00:07:18.344 --> 00:07:19.637 adversity in advantage,

NOTE Confidence: 0.65311982

00:07:19.640 --> 00:07:22.035 including in the adverse childhood

NOTE Confidence: 0.65311982

00:07:22.035 --> 00:07:23.951 experiences framework to later

NOTE Confidence: 0.65311982

00:07:23.951 --> 00:07:26.594 life health and mortality rates.

NOTE Confidence: 0.65311982

00:07:26.594 --> 00:07:30.520 So we know that these things exist.

NOTE Confidence: 0.65311982

00:07:30.520 --> 00:07:32.446 We know they're common across species,

NOTE Confidence: 0.65311982

00:07:32.450 --> 00:07:34.472 but there are a number of

NOTE Confidence: 0.65311982

00:07:34.472 --> 00:07:35.820 lingering questions about why,

NOTE Confidence: 0.65311982

00:07:35.820 --> 00:07:38.420 how and when these types

NOTE Confidence: 0.65311982

00:07:38.420 --> 00:07:39.980 of relationships arise,

NOTE Confidence: 0.65311982

00:07:39.980 --> 00:07:41.945 including whether childhood adversity or

NOTE Confidence: 0.65311982

00:07:41.945 --> 00:07:44.650 early life adversity leads to differences.

NOTE Confidence: 0.65311982

00:07:44.650 --> 00:07:46.192 In natural lifespan,

NOTE Confidence: 0.65311982

00:07:46.192 --> 00:07:48.762 in completely natural primate populations

NOTE Confidence: 0.65311982

00:07:48.762 --> 00:07:51.782 in the way that has been observed

NOTE Confidence: 0.65311982

00:07:51.782 --> 00:07:54.040 in humans to get at these questions,

NOTE Confidence: 0.65311982

00:07:54.040 --> 00:07:56.476 I've been lucky enough to Co direct

NOTE Confidence: 0.65311982

00:07:56.476 --> 00:07:58.670 the Amboseli Baboon Research Project,

NOTE Confidence: 0.65311982

00:07:58.670 --> 00:08:00.777 which is a launch toodle field study

NOTE Confidence: 0.65311982

00:08:00.777 --> 00:08:02.768 of wild primates in southern Kenya.

NOTE Confidence: 0.65311982

00:08:02.770 --> 00:08:04.370 That's now been running continuously

NOTE Confidence: 0.65311982

00:08:04.370 --> 00:08:05.650 for over 50 years,

NOTE Confidence: 0.65311982

00:08:05.650 --> 00:08:07.197 so this is actually the first talk

NOTE Confidence: 0.65311982

00:08:07.197 --> 00:08:08.868 where I get to say over 50 years

NOTE Confidence: 0.65311982

00:08:08.868 --> 00:08:10.830 and what we mean by that is that

NOTE Confidence: 0.65311982

00:08:10.830 --> 00:08:11.781 individually recognized animals

NOTE Confidence: 0.65311982

00:08:11.781 --> 00:08:13.438 in this population so recognized

NOTE Confidence: 0.65311982

00:08:13.438 --> 00:08:15.378 on site by trained observers.

NOTE Confidence: 0.65311982

00:08:15.380 --> 00:08:17.198 Have been watched on a near

NOTE Confidence: 0.65311982

00:08:17.198 --> 00:08:19.029 daily basis for those 50 years.

NOTE Confidence: 0.65311982

00:08:19.030 --> 00:08:19.796 Of course,

NOTE Confidence: 0.65311982

00:08:19.796 --> 00:08:21.328 that that constitutes multiple

NOTE Confidence: 0.65311982

00:08:21.328 --> 00:08:22.477 generations of baboons.

NOTE Confidence: 0.65311982

00:08:22.480 --> 00:08:25.240 We collect data on their social

NOTE Confidence: 0.65311982

00:08:25.240 --> 00:08:27.710 interactions on their reproductive history.

NOTE Confidence: 0.65311982

00:08:27.710 --> 00:08:30.132 On life span and we also complement

NOTE Confidence: 0.65311982

00:08:30.132 --> 00:08:32.206 those data with information on

NOTE Confidence: 0.65311982

00:08:32.206 --> 00:08:34.616 their endocrine profiles on their

NOTE Confidence: 0.65311982

00:08:34.616 --> 00:08:36.879 genetic relatedness to one another

NOTE Confidence: 0.65311982

00:08:36.880 --> 00:08:39.652 on their microbiome and on their

NOTE Confidence: 0.65311982

00:08:39.652 --> 00:08:41.500 gene regulation more recently.

NOTE Confidence: 0.65311982

00:08:41.500 --> 00:08:42.295 Like I said,

NOTE Confidence: 0.65311982

00:08:42.295 --> 00:08:44.740 this has been a 50 year plus project,

NOTE Confidence: 0.65311982

00:08:44.740 --> 00:08:47.708 so I've had the the ability to work

NOTE Confidence: 0.65311982

00:08:47.708 --> 00:08:50.618 on this really singular resource

NOTE Confidence: 0.65311982

00:08:50.620 --> 00:08:53.140 through the foresight of Jean Altman,

NOTE Confidence: 0.65311982

00:08:53.140 --> 00:08:55.280 who founded the project in 1971

NOTE Confidence: 0.65311982

00:08:55.280 --> 00:08:57.380 with her husband, Stuart Altman.

NOTE Confidence: 0.65311982

00:08:57.380 --> 00:08:57.914 Susan Alberts,

NOTE Confidence: 0.65311982

00:08:57.914 --> 00:08:59.783 who's also at Duke and Beth Archie

NOTE Confidence: 0.65311982

00:08:59.783 --> 00:09:01.598 at the University of Notre Dame.

NOTE Confidence: 0.65311982

00:09:01.600 --> 00:09:05.030 And together we Co. Direct this project.

NOTE Confidence: 0.65311982

00:09:05.030 --> 00:09:07.082 A large number of our employees

NOTE Confidence: 0.65311982

00:09:07.082 --> 00:09:09.489 on the project our Kenyan and are

NOTE Confidence: 0.65311982

00:09:09.489 --> 00:09:11.743 based in Kenya at the field site

NOTE Confidence: 0.876031055

00:09:11.811 --> 00:09:14.051 or in Nairobi and so all of the

NOTE Confidence: 0.876031055

00:09:14.051 --> 00:09:16.604 data that I'll be talking to

NOTE Confidence: 0.876031055

00:09:16.604 --> 00:09:19.084 you about today were collected.

NOTE Confidence: 0.876031055

00:09:19.090 --> 00:09:21.855 In partnership with them and they are

NOTE Confidence: 0.876031055

00:09:21.855 --> 00:09:23.565 a really extraordinary professional

NOTE Confidence: 0.876031055

00:09:23.565 --> 00:09:25.865 and talented group of people.

NOTE Confidence: 0.876031055

00:09:25.870 --> 00:09:29.326 So I want to acknowledge them and here too.

NOTE Confidence: 0.876031055

00:09:29.330 --> 00:09:31.381 OK, so I told you we've been

NOTE Confidence: 0.876031055

00:09:31.381 --> 00:09:32.910 watching these animals for 50

NOTE Confidence: 0.876031055

00:09:32.910 --> 00:09:34.385 some years in the background.

NOTE Confidence: 0.876031055

00:09:34.390 --> 00:09:36.728 Here is the pedigree for those animals.

NOTE Confidence: 0.876031055

00:09:36.730 --> 00:09:38.410 Both maternal lines and yellow

NOTE Confidence: 0.876031055

00:09:38.410 --> 00:09:40.090 and paternal lines in blue.

NOTE Confidence: 0.876031055

00:09:40.090 --> 00:09:42.860 We're now up to just over 2100

NOTE Confidence: 0.876031055

00:09:42.860 --> 00:09:45.910 known individuals in the population,

NOTE Confidence: 0.876031055

00:09:45.910 --> 00:09:47.912 and the ones who we followed the

NOTE Confidence: 0.876031055

00:09:47.912 --> 00:09:49.696 longest are from families that we

NOTE Confidence: 0.876031055

00:09:49.696 --> 00:09:52.000 have up to 9 generations of data for.

NOTE Confidence: 0.876031055

00:09:52.000 --> 00:09:53.745 So using this information which

NOTE Confidence: 0.876031055

00:09:53.745 --> 00:09:56.184 goes across the full life course

NOTE Confidence: 0.876031055

00:09:56.184 --> 00:09:57.448 and intergenerationally.

NOTE Confidence: 0.876031055

00:09:57.450 --> 00:09:59.380 We are interested in understanding

NOTE Confidence: 0.876031055

00:09:59.380 --> 00:10:01.310 the consequences of early life

NOTE Confidence: 0.876031055

00:10:01.377 --> 00:10:03.307 experience and early life adversity

NOTE Confidence: 0.876031055

00:10:03.307 --> 00:10:05.237 for natural mortality in this

NOTE Confidence: 0.876031055

00:10:05.304 --> 00:10:06.944 sort of prospectively intensively

NOTE Confidence: 0.876031055

00:10:06.944 --> 00:10:08.994 monitored setting that is free

NOTE Confidence: 0.876031055

00:10:08.994 --> 00:10:11.402 from the types of potentially

NOTE Confidence: 0.876031055

00:10:11.402 --> 00:10:13.394 confounding or potentially mediating.

NOTE Confidence: 0.876031055

00:10:13.400 --> 00:10:15.068 Depending on your question,

NOTE Confidence: 0.876031055

00:10:15.068 --> 00:10:16.736 factors that influence early

NOTE Confidence: 0.876031055

00:10:16.736 --> 00:10:18.239 life effects in humans.

NOTE Confidence: 0.876031055

00:10:18.240 --> 00:10:19.880 We're interested, of course,

NOTE Confidence: 0.876031055

00:10:19.880 --> 00:10:22.952 as as as scientists trained from an

NOTE Confidence: 0.876031055

00:10:22.952 --> 00:10:24.475 evolutionary biology, tradition,

NOTE Confidence: 0.876031055

00:10:24.475 --> 00:10:26.255 and understanding why these

NOTE Confidence: 0.876031055

00:10:26.255 --> 00:10:28.960 effects exist in the first place.

NOTE Confidence: 0.876031055

00:10:28.960 --> 00:10:31.389 Is there a reason for animals to

NOTE Confidence: 0.876031055

00:10:31.389 --> 00:10:33.360 adjust their phenotypes in a way that,

NOTE Confidence: 0.876031055

00:10:33.360 --> 00:10:34.150 for example,

NOTE Confidence: 0.876031055

00:10:34.150 --> 00:10:36.915 predicts how they'll deal with later life,

NOTE Confidence: 0.876031055

00:10:36.920 --> 00:10:37.946 environmental adversity,

NOTE Confidence: 0.876031055

00:10:37.946 --> 00:10:41.537 and as many of you may be?

NOTE Confidence: 0.876031055

00:10:41.540 --> 00:10:43.654 We are interested in how these types

NOTE Confidence: 0.876031055

00:10:43.654 --> 00:10:46.058 of early life effects may arise.

NOTE Confidence: 0.876031055

00:10:46.058 --> 00:10:49.082 What links and experience that may

NOTE Confidence: 0.876031055

00:10:49.082 --> 00:10:52.139 occur decades prior to the phenotypes

NOTE Confidence: 0.876031055

00:10:52.140 --> 00:10:55.224 that we observe with the internal

NOTE Confidence: 0.876031055

00:10:55.224 --> 00:10:58.150 physiological states that those organisms?

NOTE Confidence: 0.876031055

00:10:58.150 --> 00:11:00.362 So there is quite a bit of

NOTE Confidence: 0.876031055

00:11:00.362 --> 00:11:02.264 literature in our population as

NOTE Confidence: 0.876031055

00:11:02.264 --> 00:11:04.469 well as in nonhuman primates.

NOTE Confidence: 0.876031055

00:11:04.470 --> 00:11:06.130 Generally, including from your colleague,

NOTE Confidence: 0.876031055

00:11:06.130 --> 00:11:06.730 Amanda Detmer,

NOTE Confidence: 0.876031055

00:11:06.730 --> 00:11:08.530 who I think I saw here.

NOTE Confidence: 0.876031055

00:11:08.530 --> 00:11:09.330 Hi Amanda,

NOTE Confidence: 0.876031055

00:11:09.330 --> 00:11:11.730 on different sources of early life

NOTE Confidence: 0.876031055

00:11:11.730 --> 00:11:13.454 experience and downstream effects

NOTE Confidence: 0.876031055

00:11:13.454 --> 00:11:16.004 in the juvenile or adult period,

NOTE Confidence: 0.876031055

00:11:16.010 --> 00:11:18.160 for example, in Amboseli alone,

NOTE Confidence: 0.876031055

00:11:18.160 --> 00:11:20.085 we know that early life social status

NOTE Confidence: 0.876031055

00:11:20.085 --> 00:11:21.887 has long term predictive relationships

NOTE Confidence: 0.876031055

00:11:21.887 --> 00:11:24.641 with the timing of maturation with

NOTE Confidence: 0.876031055

00:11:24.641 --> 00:11:25.892 glucocorticoid Physiology and

NOTE Confidence: 0.876031055

00:11:25.892 --> 00:11:27.554 with the ability of animals too.

NOTE Confidence: 0.876031055

00:11:27.560 --> 00:11:29.900 Resist drought later in life.

NOTE Confidence: 0.876031055

00:11:29.900 --> 00:11:32.318 We know that mothers are exceptionally

NOTE Confidence: 0.876031055

00:11:32.318 --> 00:11:34.699 important for baboons because like humans,

NOTE Confidence: 0.876031055

00:11:34.700 --> 00:11:37.024 baboon babies experience long

NOTE Confidence: 0.876031055

00:11:37.024 --> 00:11:39.929 periods of nutritional and social

NOTE Confidence: 0.876031055

00:11:39.929 --> 00:11:41.906 dependency and and and individuals

NOTE Confidence: 0.876031055

00:11:41.906 --> 00:11:44.000 who lose their mothers early in

NOTE Confidence: 0.876031055

00:11:44.071 --> 00:11:46.525 life are very unlikely to survive

NOTE Confidence: 0.876031055

00:11:46.525 --> 00:11:47.752 themselves to adulthood.

NOTE Confidence: 0.876031055

00:11:47.760 --> 00:11:48.261 Similarly,

NOTE Confidence: 0.876031055

00:11:48.261 --> 00:11:50.766 animals who have relatively socially

NOTE Confidence: 0.876031055

00:11:50.766 --> 00:11:53.688 isolated mothers are less likely to

NOTE Confidence: 0.876031055

00:11:53.688 --> 00:11:56.628 make it to their own reproductive maturation.

NOTE Confidence: 0.876031055

00:11:56.630 --> 00:11:57.815 Resource competition influences

NOTE Confidence: 0.876031055

00:11:57.815 --> 00:12:00.185 many of these outcomes as well,

NOTE Confidence: 0.876031055

00:12:00.190 --> 00:12:01.754 including maturation timing and

NOTE Confidence: 0.876031055

00:12:01.754 --> 00:12:03.709 certain patterns of gene regulation

NOTE Confidence: 0.876031055

00:12:03.709 --> 00:12:05.209 and early life drought.

NOTE Confidence: 0.876031055

00:12:05.210 --> 00:12:07.160 This is a highly variable environment,

NOTE Confidence: 0.876031055

00:12:07.160 --> 00:12:09.854 has strong effects on female fertility

NOTE Confidence: 0.876031055

00:12:09.854 --> 00:12:12.499 and later life resilience to drought.

NOTE Confidence: 0.876031055

00:12:12.500 --> 00:12:15.162 So all of these papers pursued

NOTE Confidence: 0.876031055

00:12:15.162 --> 00:12:17.822 individual sources of early life

NOTE Confidence: 0.876031055

00:12:17.822 --> 00:12:19.950 experience and in connection

NOTE Confidence: 0.876031055

00:12:20.033 --> 00:12:22.577 with individual outcome variables

NOTE Confidence: 0.876031055

00:12:22.580 --> 00:12:24.076 we became very inspired.

NOTE Confidence: 0.876031055

00:12:24.076 --> 00:12:27.027 Actually by work done in humans in the

NOTE Confidence: 0.876031055

00:12:27.027 --> 00:12:28.947 Asus framework to ask what happens

NOTE Confidence: 0.876031055

00:12:28.947 --> 00:12:31.530 if you look at them in conjunction.

NOTE Confidence: 0.876031055

00:12:31.530 --> 00:12:32.200 In fact,

NOTE Confidence: 0.876031055

00:12:32.200 --> 00:12:34.880 if you do something as simple as counting

NOTE Confidence: 0.908250413684211

00:12:34.949 --> 00:12:37.553 up the number of sources of advantage

NOTE Confidence: 0.908250413684211

00:12:37.553 --> 00:12:39.815 or adversity that baboon baboons

NOTE Confidence: 0.908250413684211

00:12:39.815 --> 00:12:42.340 can experience early in life,

NOTE Confidence: 0.908250413684211

00:12:42.340 --> 00:12:44.158 so we considered. Six of them,

NOTE Confidence: 0.908250413684211

00:12:44.160 --> 00:12:47.088 in a baboon parallel of an ACE score,

NOTE Confidence: 0.908250413684211

00:12:47.090 --> 00:12:48.618 early life social status.

NOTE Confidence: 0.908250413684211

00:12:48.618 --> 00:12:50.910 So the the dominance rank the

NOTE Confidence: 0.908250413684211

00:12:50.988 --> 00:12:53.238 position on a linear social hierarchy

NOTE Confidence: 0.908250413684211

00:12:53.238 --> 00:12:55.788 of the mother of a baby baboon.

NOTE Confidence: 0.908250413684211

00:12:55.790 --> 00:12:59.558 Whether or not that baby reached

NOTE Confidence: 0.908250413684211

00:12:59.560 --> 00:13:00.286 reproductive maturation.

NOTE Confidence: 0.908250413684211

00:13:00.286 --> 00:13:02.464 So men are key for females.

NOTE Confidence: 0.908250413684211

00:13:02.470 --> 00:13:04.459 Testicular enlargement for

NOTE Confidence: 0.908250413684211

00:13:04.459 --> 00:13:07.774 males without losing its mother.

NOTE Confidence: 0.908250413684211

00:13:07.780 --> 00:13:09.790 How isolated or integrated that

NOTE Confidence: 0.908250413684211

00:13:09.790 --> 00:13:12.673 mother was based on the results I

NOTE Confidence: 0.908250413684211

00:13:12.673 --> 00:13:15.438 showed you earlier that that type of

NOTE Confidence: 0.908250413684211

00:13:15.438 --> 00:13:17.889 pattern predicts juvenile survival,

NOTE Confidence: 0.908250413684211

00:13:17.890 --> 00:13:19.474 whether maternal resources were

NOTE Confidence: 0.908250413684211

00:13:19.474 --> 00:13:21.850 diverted by a competing younger sibling.

NOTE Confidence: 0.908250413684211

00:13:21.850 --> 00:13:24.520 So inter birth intervals in

NOTE Confidence: 0.908250413684211

00:13:24.520 --> 00:13:26.376 our population get very short,

NOTE Confidence: 0.908250413684211

00:13:26.376 --> 00:13:28.210 the lowest quartile is about a year

NOTE Confidence: 0.908250413684211

00:13:28.263 --> 00:13:29.957 and a half in her birth interval.

NOTE Confidence: 0.908250413684211

00:13:29.960 --> 00:13:32.312 So we asked whether individuals were

NOTE Confidence: 0.908250413684211

00:13:32.312 --> 00:13:35.126 faced with a little brother or sister

NOTE Confidence: 0.908250413684211

00:13:35.126 --> 00:13:37.870 within that very short period of time.

NOTE Confidence: 0.908250413684211

00:13:37.870 --> 00:13:40.830 We asked about resource competition.

NOTE Confidence: 0.908250413684211

00:13:40.830 --> 00:13:42.094 This experience density so

NOTE Confidence: 0.908250413684211

00:13:42.094 --> 00:13:43.674 the size of social groups.

NOTE Confidence: 0.908250413684211

00:13:43.680 --> 00:13:44.808 Who of animals?

NOTE Confidence: 0.908250413684211

00:13:44.808 --> 00:13:47.064 Who are a given focal animals

NOTE Confidence: 0.908250413684211

00:13:47.064 --> 00:13:48.260 immediate competitor?

NOTE Confidence: 0.908250413684211

00:13:48.260 --> 00:13:50.717 And we asked about exposure to environmental

NOTE Confidence: 0.908250413684211

00:13:50.717 --> 00:13:52.750 adversity in the form of drought.

NOTE Confidence: 0.908250413684211

00:13:52.750 --> 00:13:54.430 This is a very dry environment as

NOTE Confidence: 0.908250413684211

00:13:54.430 --> 00:13:56.179 I'll show you a little bit later,

NOTE Confidence: 0.908250413684211

00:13:56.180 --> 00:14:00.660 but some years are much wetter than others,

NOTE Confidence: 0.908250413684211

00:14:00.660 --> 00:14:02.580 so our interest here was not

NOTE Confidence: 0.908250413684211

00:14:02.580 --> 00:14:03.540 what happened immediately.

NOTE Confidence: 0.908250413684211

00:14:03.540 --> 00:14:05.505 It's perhaps unsurprising if an

NOTE Confidence: 0.908250413684211

00:14:05.505 --> 00:14:07.945 animal loses its mother when it's

NOTE Confidence: 0.908250413684211

00:14:07.945 --> 00:14:09.545 so nutritionally dependent that

NOTE Confidence: 0.908250413684211

00:14:09.545 --> 00:14:11.545 it doesn't do very well,

NOTE Confidence: 0.908250413684211

00:14:11.550 --> 00:14:13.100 but rather in what happens

NOTE Confidence: 0.908250413684211

00:14:13.100 --> 00:14:15.020 over a longer stretch of time,

NOTE Confidence: 0.908250413684211

00:14:15.020 --> 00:14:16.288 separated from early life.

NOTE Confidence: 0.908250413684211

00:14:16.288 --> 00:14:18.550 So here we're specifically asking me about.

NOTE Confidence: 0.908250413684211

00:14:18.550 --> 00:14:20.926 Events that happen early in life

NOTE Confidence: 0.908250413684211

00:14:20.926 --> 00:14:22.996 exposures that occur early in

NOTE Confidence: 0.908250413684211

00:14:22.996 --> 00:14:25.046 life and their predictive value

NOTE Confidence: 0.908250413684211

00:14:25.046 --> 00:14:26.686 for survival in adulthood.

NOTE Confidence: 0.908250413684211

00:14:26.690 --> 00:14:30.810 So starting around age 4 for these animals.

NOTE Confidence: 0.908250413684211

00:14:30.810 --> 00:14:35.466 Unlike what is typical in aces and humans,

NOTE Confidence: 0.908250413684211

00:14:35.470 --> 00:14:37.035 these six sources of adversity

NOTE Confidence: 0.908250413684211

00:14:37.035 --> 00:14:38.600 are actually not very closely

NOTE Confidence: 0.908250413684211

00:14:38.659 --> 00:14:40.067 correlated with each other.

NOTE Confidence: 0.908250413684211

00:14:40.070 --> 00:14:40.781 In other words,

NOTE Confidence: 0.908250413684211

00:14:40.781 --> 00:14:42.748 it's not the case that if an animal

NOTE Confidence: 0.908250413684211

00:14:42.748 --> 00:14:44.533 is born to a low status mother,

NOTE Confidence: 0.908250413684211

00:14:44.540 --> 00:14:46.570 she is more likely to be born

NOTE Confidence: 0.908250413684211

00:14:46.570 --> 00:14:48.560 to a socially socially isolated

NOTE Confidence: 0.908250413684211

00:14:48.560 --> 00:14:51.190 mother or experience higher degrees

NOTE Confidence: 0.908250413684211

00:14:51.190 --> 00:14:52.768 of resource competition.

NOTE Confidence: 0.908250413684211

00:14:52.770 --> 00:14:54.898 So we're able to parse those different

NOTE Confidence: 0.908250413684211

00:14:54.898 --> 00:14:57.109 types of experiences separately from another.

NOTE Confidence: 0.908250413684211

00:14:57.110 --> 00:14:58.888 A little bit more cleanly than is

NOTE Confidence: 0.908250413684211

00:14:58.888 --> 00:15:00.560 typical in human studies, and.

NOTE Confidence: 0.908250413684211

00:15:00.560 --> 00:15:02.360 In the same vein,

NOTE Confidence: 0.908250413684211

00:15:02.360 --> 00:15:04.952 early life environment is not very

NOTE Confidence: 0.908250413684211

00:15:04.952 --> 00:15:06.680 correlated with environment that

NOTE Confidence: 0.908250413684211

00:15:06.745 --> 00:15:08.805 experience that animals experience

NOTE Confidence: 0.908250413684211

00:15:08.805 --> 00:15:09.835 in adulthood.

NOTE Confidence: 0.908250413684211

00:15:09.840 --> 00:15:11.820 So here's the breakdown about 1/5

NOTE Confidence: 0.908250413684211

00:15:11.820 --> 00:15:14.247 to 1/4 of this is actually females

NOTE Confidence: 0.908250413684211

00:15:14.247 --> 00:15:16.655 in this case of females in our

NOTE Confidence: 0.908250413684211

00:15:16.727 --> 00:15:18.833 study population are what we think

NOTE Confidence: 0.908250413684211

00:15:18.833 --> 00:15:21.737 of as our silver spoon babies who

NOTE Confidence: 0.908250413684211

00:15:21.737 --> 00:15:23.733 experience no particular sources

NOTE Confidence: 0.908250413684211

00:15:23.733 --> 00:15:26.340 of major adversity early in life.

NOTE Confidence: 0.908250413684211

00:15:26.340 --> 00:15:27.840 Another third of them experienced

NOTE Confidence: 0.908250413684211

00:15:27.840 --> 00:15:29.040 one of these six,

NOTE Confidence: 0.908250413684211

00:15:29.040 --> 00:15:31.189 and then the more unfortunate ones are.

NOTE Confidence: 0.908250413684211

00:15:31.190 --> 00:15:34.190 Faced with two or even three or more

NOTE Confidence: 0.908250413684211

00:15:34.190 --> 00:15:36.778 sources of major early adversity.

NOTE Confidence: 0.908250413684211

00:15:36.780 --> 00:15:39.183 So I'll cut right to the chase again here.

NOTE Confidence: 0.908250413684211

00:15:39.190 --> 00:15:42.095 The ages on the X axis represent

NOTE Confidence: 0.908250413684211

00:15:42.095 --> 00:15:43.340 adulthood in baboons,

NOTE Confidence: 0.908250413684211

00:15:43.340 --> 00:15:45.476 and here I'm showing you survival

NOTE Confidence: 0.908250413684211

00:15:45.476 --> 00:15:47.390 curves stratified by that baboon.

NOTE Confidence: 0.908250413684211

00:15:47.390 --> 00:15:51.166 Aces score from zero to three or more.

NOTE Confidence: 0.905359847333333

00:15:51.170 --> 00:15:53.754 This is the kind of result where we

NOTE Confidence: 0.905359847333333

00:15:53.754 --> 00:15:56.496 actually did not expect something so clean,

NOTE Confidence: 0.905359847333333

00:15:56.500 --> 00:15:57.837 and when I show it to you,

NOTE Confidence: 0.905359847333333

00:15:57.840 --> 00:15:59.814 it's you know you almost don't

NOTE Confidence: 0.905359847333333

00:15:59.814 --> 00:16:01.380 need statistics to see it,

NOTE Confidence: 0.905359847333333

00:16:01.380 --> 00:16:04.036 but I'll tell you that what we're showing

NOTE Confidence: 0.905359847333333

00:16:04.036 --> 00:16:06.989 you is a difference in median survival.

NOTE Confidence: 0.905359847333333

00:16:06.990 --> 00:16:08.830 Highly significant difference in

NOTE Confidence: 0.905359847333333

00:16:08.830 --> 00:16:11.130 median survival depending on the

NOTE Confidence: 0.905359847333333

00:16:11.130 --> 00:16:13.129 number of adverse experiences,

NOTE Confidence: 0.905359847333333

00:16:13.130 --> 00:16:15.580 a baby baboon faced that leads to

NOTE Confidence: 0.905359847333333

00:16:15.580 --> 00:16:17.486 a difference in lifespan between

NOTE Confidence: 0.905359847333333

00:16:17.486 --> 00:16:19.426 about 18 or 19 years.

NOTE Confidence: 0.905359847333333

00:16:19.430 --> 00:16:21.698 Assuming that an animal gets to

NOTE Confidence: 0.905359847333333

00:16:21.700 --> 00:16:23.525 reproductive maturation to about 9

NOTE Confidence: 0.905359847333333

00:16:23.525 --> 00:16:25.803 years for those animals who experience

NOTE Confidence: 0.905359847333333

00:16:25.803 --> 00:16:28.125 three or more sources of adversity,

NOTE Confidence: 0.905359847333333

00:16:28.130 --> 00:16:30.244 it's sometimes useful to put these in,

NOTE Confidence: 0.905359847333333

00:16:30.250 --> 00:16:32.870 you know, coarsely translated terms,

NOTE Confidence: 0.905359847333333

00:16:32.870 --> 00:16:35.886 so this is a decade in real time.

NOTE Confidence: 0.905359847333333

00:16:35.890 --> 00:16:36.716 The lifespan.

NOTE Confidence: 0.905359847333333

00:16:36.716 --> 00:16:40.020 And the sort of life history of pace

NOTE Confidence: 0.905359847333333

00:16:40.103 --> 00:16:42.871 of life of baboons is about 2 1/2

NOTE Confidence: 0.905359847333333

00:16:42.871 --> 00:16:45.719 to three times faster than humans.

NOTE Confidence: 0.905359847333333

00:16:45.720 --> 00:16:47.673 So what I'm showing you here is a decade.

NOTE Confidence: 0.905359847333333

00:16:47.680 --> 00:16:49.234 If we put that in human terms,

NOTE Confidence: 0.905359847333333

00:16:49.240 --> 00:16:51.000 we're talking about differences of

NOTE Confidence: 0.905359847333333

00:16:51.000 --> 00:16:54.283 20 to 30 years in a population where

NOTE Confidence: 0.905359847333333

00:16:54.283 --> 00:16:57.175 everyone has equivalent access to healthcare.

NOTE Confidence: 0.905359847333333

00:16:57.180 --> 00:16:59.340 Because there is no health care.

NOTE Confidence: 0.905359847333333

00:16:59.340 --> 00:17:01.060 There is no smoking.

NOTE Confidence: 0.905359847333333

00:17:01.060 --> 00:17:02.780 There is no alcoholism.

NOTE Confidence: 0.905359847333333

00:17:02.780 --> 00:17:04.190 There are no illicit drugs.

NOTE Confidence: 0.905359847333333

00:17:04.190 --> 00:17:06.596 There are no motorcycles, etc etc.

NOTE Confidence: 0.905359847333333

00:17:06.600 --> 00:17:08.520 And yet there's this very pronounced.

NOTE Confidence: 0.905359847333333

00:17:08.520 --> 00:17:12.895 Long lasting effect on adult mortality rates.

NOTE Confidence: 0.905359847333333

00:17:12.900 --> 00:17:14.340 OK, perhaps interestingly,

NOTE Confidence: 0.905359847333333

00:17:14.340 --> 00:17:19.159 for any of you who use the Asus framework,

NOTE Confidence: 0.905359847333333

00:17:19.160 --> 00:17:21.840 which is proposed in some cases to move

NOTE Confidence: 0.905359847333333

00:17:21.840 --> 00:17:24.860 through an intermediary of effects on social,

NOTE Confidence: 0.905359847333333

00:17:24.860 --> 00:17:26.056 emotional and cognitive development,

NOTE Confidence: 0.905359847333333

00:17:26.056 --> 00:17:27.850 what we find is that individuals

NOTE Confidence: 0.905359847333333

00:17:27.901 --> 00:17:28.639 are silver spoon.

NOTE Confidence: 0.905359847333333

00:17:28.640 --> 00:17:31.256 Babies end up growing up to be socially

NOTE Confidence: 0.905359847333333

00:17:31.256 --> 00:17:33.193 more integrated and socially better

NOTE Confidence: 0.905359847333333

00:17:33.193 --> 00:17:35.218 connected than are individuals who

NOTE Confidence: 0.905359847333333

00:17:35.218 --> 00:17:37.756 experienced a lot of early life adversity,

NOTE Confidence: 0.905359847333333

00:17:37.760 --> 00:17:40.210 which is perhaps one of the mediating

NOTE Confidence: 0.905359847333333

00:17:40.210 --> 00:17:43.008 factors that may explain this relationship.

NOTE Confidence: 0.905359847333333

00:17:43.010 --> 00:17:44.862 Although separate analysis suggest

NOTE Confidence: 0.905359847333333

00:17:44.862 --> 00:17:47.640 it certainly can't explain at all.

NOTE Confidence: 0.905359847333333

00:17:47.640 --> 00:17:49.720 And for any of you who may be

NOTE Confidence: 0.905359847333333

00:17:49.720 --> 00:17:51.239 interested in the evolutionary

NOTE Confidence: 0.905359847333333

00:17:51.239 --> 00:17:53.099 ramifications of this result,

NOTE Confidence: 0.905359847333333

00:17:53.100 --> 00:17:55.977 what we find is that this shortened

NOTE Confidence: 0.905359847333333

00:17:55.977 --> 00:17:58.674 lifespan not only influences a

NOTE Confidence: 0.905359847333333

00:17:58.674 --> 00:18:02.146 female's own time on time on earth,

NOTE Confidence: 0.905359847333333

00:18:02.146 --> 00:18:03.906 but also the likelihood that

NOTE Confidence: 0.905359847333333

00:18:03.906 --> 00:18:06.129 she'll leave many copies of her

NOTE Confidence: 0.905359847333333

00:18:06.129 --> 00:18:07.944 own genome in future generations,

NOTE Confidence: 0.905359847333333

00:18:07.950 --> 00:18:10.570 and Amboseli females produce another

NOTE Confidence: 0.905359847333333

00:18:10.570 --> 00:18:12.500 surviving offspring you know,

NOTE Confidence: 0.905359847333333

00:18:12.500 --> 00:18:14.260 not quite like clockwork,

NOTE Confidence: 0.905359847333333

00:18:14.260 --> 00:18:17.388 but pretty close to it about every 2.1 years.

NOTE Confidence: 0.905359847333333

00:18:17.388 --> 00:18:21.310 So a difference in lifespan of 10 years

NOTE Confidence: 0.905359847333333

00:18:21.310 --> 00:18:25.130 is a dramatic difference in terms of an

NOTE Confidence: 0.905359847333333

00:18:25.130 --> 00:18:28.330 individual's lifetime reproductive success.

NOTE Confidence: 0.905359847333333

00:18:28.330 --> 00:18:31.210 So a former graduate student working

NOTE Confidence: 0.905359847333333

00:18:31.210 --> 00:18:33.130 with the project specifically,

NOTE Confidence: 0.905359847333333

00:18:33.130 --> 00:18:34.466 and Susan Alberts lab,

NOTE Confidence: 0.905359847333333

00:18:34.466 --> 00:18:36.136 was interested in whether this

NOTE Confidence: 0.905359847333333

00:18:36.136 --> 00:18:37.749 also had knock on effects.

NOTE Confidence: 0.905359847333333

00:18:37.750 --> 00:18:39.782 Intergenerationally given the importance

NOTE Confidence: 0.905359847333333

00:18:39.782 --> 00:18:43.710 of moms to their offspring in particular.

NOTE Confidence: 0.905359847333333

00:18:43.710 --> 00:18:46.420 So what I've been showing you so far is early

NOTE Confidence: 0.905359847333333

00:18:46.480 --> 00:18:49.006 adversity accruing to a particular female,

NOTE Confidence: 0.905359847333333

00:18:49.010 --> 00:18:51.089 and the consequences for her own life.

NOTE Confidence: 0.905359847333333

00:18:51.090 --> 00:18:54.254 What he wanted to know is whether.

NOTE Confidence: 0.905359847333333

00:18:54.260 --> 00:18:56.864 Early adversity experienced by the mother

NOTE Confidence: 0.905359847333333

00:18:56.864 --> 00:18:59.848 had cascading effects on her kids survival,

NOTE Confidence: 0.905359847333333

00:18:59.850 --> 00:19:02.118 even controlling for that kids own

NOTE Confidence: 0.905359847333333

00:19:02.118 --> 00:19:05.148 exposure to the same sources of adversity.

NOTE Confidence: 0.905359847333333

00:19:05.150 --> 00:19:05.914 Remarkably remarkably,

NOTE Confidence: 0.905359847333333

00:19:05.914 --> 00:19:08.970 we see that it does so here again,

NOTE Confidence: 0.912698818333333

00:19:08.970 --> 00:19:10.866 our survival curves, in this case,

NOTE Confidence: 0.912698818333333

00:19:10.870 --> 00:19:12.582 survival to reproductive maturation

NOTE Confidence: 0.912698818333333

00:19:12.582 --> 00:19:14.722 for the offspring of mothers

NOTE Confidence: 0.912698818333333

00:19:14.722 --> 00:19:16.859 who experienced maternal loss.

NOTE Confidence: 0.912698818333333

00:19:16.860 --> 00:19:18.702 You know what could have been

NOTE Confidence: 0.912698818333333

00:19:18.702 --> 00:19:19.930 decades earlier in life,

NOTE Confidence: 0.912698818333333

00:19:19.930 --> 00:19:22.396 or mothers who experienced that competing

NOTE Confidence: 0.912698818333333

00:19:22.396 --> 00:19:24.806 younger sibling again in what could

NOTE Confidence: 0.912698818333333

00:19:24.806 --> 00:19:26.906 have been decades earlier in life?

NOTE Confidence: 0.912698818333333

00:19:26.910 --> 00:19:30.582 So in both cases kids of moms who

NOTE Confidence: 0.912698818333333

00:19:30.582 --> 00:19:32.840 experienced early adversity were

NOTE Confidence: 0.912698818333333

00:19:32.840 --> 00:19:35.850 more likely to to die before they

NOTE Confidence: 0.912698818333333

00:19:35.850 --> 00:19:38.318 hit their own period of independence.

NOTE Confidence: 0.912698818333333

00:19:38.318 --> 00:19:41.230 We think we know what's mediating this,

NOTE Confidence: 0.912698818333333

00:19:41.230 --> 00:19:43.963 at least at a gross level and

NOTE Confidence: 0.912698818333333

00:19:43.963 --> 00:19:46.504 and that is likely an effect on

NOTE Confidence: 0.912698818333333

00:19:46.504 --> 00:19:48.230 maternal health or viability.

NOTE Confidence: 0.912698818333333

00:19:48.230 --> 00:19:50.150 That is, the moms of those.

NOTE Confidence: 0.912698818333333

00:19:50.150 --> 00:19:51.590 Those second generation

NOTE Confidence: 0.912698818333333

00:19:51.590 --> 00:19:53.990 offspring to ask this question.

NOTE Confidence: 0.912698818333333

00:19:53.990 --> 00:19:55.710 Matthew divided up those

NOTE Confidence: 0.912698818333333

00:19:55.710 --> 00:19:57.860 first four years of life.

NOTE Confidence: 0.912698818333333

00:19:57.860 --> 00:20:00.420 From birth to earliest maturation,

NOTE Confidence: 0.912698818333333

00:20:00.420 --> 00:20:03.846 he asked what the survival probability

NOTE Confidence: 0.912698818333333

00:20:03.846 --> 00:20:07.329 was of offspring in the in the

NOTE Confidence: 0.912698818333333

00:20:07.329 --> 00:20:11.053 period from age 0 to age 2 as a

NOTE Confidence: 0.912698818333333

00:20:11.053 --> 00:20:13.728 function of whether mothers were.

NOTE Confidence: 0.912698818333333

00:20:13.730 --> 00:20:15.599 Able to survive or not during the

NOTE Confidence: 0.912698818333333

00:20:15.599 --> 00:20:17.442 period in which that offspring would

NOTE Confidence: 0.912698818333333

00:20:17.442 --> 00:20:20.908 have been age 2 to 4 sodas later,

NOTE Confidence: 0.912698818333333

00:20:20.910 --> 00:20:23.662 maternal mortality predict something

NOTE Confidence: 0.912698818333333

00:20:23.662 --> 00:20:25.878 about the survival for offspring

NOTE Confidence: 0.912698818333333

00:20:25.878 --> 00:20:27.981 earlier in life and for females

NOTE Confidence: 0.912698818333333

00:20:27.981 --> 00:20:29.566 who either experience maternal loss

NOTE Confidence: 0.912698818333333

00:20:29.566 --> 00:20:31.530 themselves or competing younger sibling.

NOTE Confidence: 0.912698818333333

00:20:31.530 --> 00:20:33.054 That's the case.

NOTE Confidence: 0.912698818333333

00:20:33.054 --> 00:20:36.550 So in other words, if you are a baboon,

NOTE Confidence: 0.912698818333333

00:20:36.550 --> 00:20:39.322 is the offspring of an individual who

NOTE Confidence: 0.912698818333333

00:20:39.322 --> 00:20:41.550 experienced early adversity in its own life,

NOTE Confidence: 0.912698818333333

00:20:41.550 --> 00:20:43.020 that individual is likely to

NOTE Confidence: 0.912698818333333

00:20:43.020 --> 00:20:44.196 be in poor somatic.

NOTE Confidence: 0.912698818333333

00:20:44.200 --> 00:20:46.234 Quality in a way that influences

NOTE Confidence: 0.912698818333333

00:20:46.234 --> 00:20:48.601 whether or not that kid is able to

NOTE Confidence: 0.912698818333333

00:20:48.601 --> 00:20:50.976 make it to age 2 even if its mother

NOTE Confidence: 0.912698818333333

00:20:50.976 --> 00:20:53.343 is there the whole time and I'll just

NOTE Confidence: 0.912698818333333

00:20:53.343 --> 00:20:54.658 tell you that this relationship.

NOTE Confidence: 0.912698818333333

00:20:54.660 --> 00:20:56.396 This difference between offspring

NOTE Confidence: 0.912698818333333

00:20:56.396 --> 00:20:59.000 survival as a function of later

NOTE Confidence: 0.912698818333333

00:20:59.073 --> 00:21:01.395 maternal death does not exist for

NOTE Confidence: 0.912698818333333

00:21:01.395 --> 00:21:04.448 the offspring of mothers who did not

NOTE Confidence: 0.912698818333333

00:21:04.448 --> 00:21:06.356 themselves experience early mortality.

NOTE Confidence: 0.912698818333333

00:21:06.360 --> 00:21:08.530 So we think that this is explained

NOTE Confidence: 0.912698818333333

00:21:08.530 --> 00:21:11.159 by what's going on with the mother's

NOTE Confidence: 0.912698818333333

00:21:11.159 --> 00:21:12.795 condition and doesn't necessarily

NOTE Confidence: 0.912698818333333

00:21:12.795 --> 00:21:14.668 require any sort of complex.

NOTE Confidence: 0.912698818333333

00:21:14.670 --> 00:21:15.556 For example,

NOTE Confidence: 0.912698818333333

00:21:15.556 --> 00:21:17.771 epigenetic explanations that that go

NOTE Confidence: 0.912698818333333

00:21:17.771 --> 00:21:21.030 into sort of transgenerational effects.

NOTE Confidence: 0.912698818333333

00:21:21.030 --> 00:21:23.754 So in this population we find

NOTE Confidence: 0.912698818333333

00:21:23.754 --> 00:21:25.570 that as in humans,

NOTE Confidence: 0.912698818333333

00:21:25.570 --> 00:21:27.873 early life is a critical period for

NOTE Confidence: 0.912698818333333

00:21:27.873 --> 00:21:29.909 development that affects lifelong survival.

NOTE Confidence: 0.912698818333333

00:21:29.910 --> 00:21:31.849 Even in a time period that's quite

NOTE Confidence: 0.912698818333333

00:21:31.849 --> 00:21:33.830 separated from the early life exposures.

NOTE Confidence: 0.912698818333333

00:21:33.830 --> 00:21:35.270 It appears to be profoundly

NOTE Confidence: 0.912698818333333

00:21:35.270 --> 00:21:36.422 affected by social resources.

NOTE Confidence: 0.912698818333333

00:21:36.430 --> 00:21:37.128 In particular,

NOTE Confidence: 0.912698818333333

00:21:37.128 --> 00:21:39.920 many of the things that pop out to

NOTE Confidence: 0.912698818333333

00:21:39.992 --> 00:21:42.127 us as individually predictive sources

NOTE Confidence: 0.912698818333333

00:21:42.127 --> 00:21:45.050 of variance have to do with moms,

NOTE Confidence: 0.912698818333333

00:21:45.050 --> 00:21:47.198 in particular maternal presence

NOTE Confidence: 0.912698818333333

00:21:47.198 --> 00:21:49.883 and maternal attention or maternal

NOTE Confidence: 0.912698818333333

00:21:49.883 --> 00:21:50.920 resources spent.

NOTE Confidence: 0.912698818333333

00:21:50.920 --> 00:21:53.428 With that particular offspring.

NOTE Confidence: 0.912698818333333

00:21:53.430 --> 00:21:54.800 Our data suggests that multiple

NOTE Confidence: 0.912698818333333

00:21:54.800 --> 00:21:56.914 hits compound to influence risk,

NOTE Confidence: 0.912698818333333

00:21:56.914 --> 00:22:00.771 so the the risk of or of earlier

NOTE Confidence: 0.912698818333333

00:22:00.771 --> 00:22:03.576 death with higher aces exceeds the

NOTE Confidence: 0.912698818333333

00:22:03.576 --> 00:22:05.844 explanatory power of looking at each

NOTE Confidence: 0.912698818333333

00:22:05.844 --> 00:22:08.329 of those individual effects alone,

NOTE Confidence: 0.912698818333333

00:22:08.330 --> 00:22:11.150 and this has intergenerational consequences,

NOTE Confidence: 0.912698818333333

00:22:11.150 --> 00:22:14.150 meaning that the viability of an

NOTE Confidence: 0.912698818333333

00:22:14.150 --> 00:22:16.239 animal that we happen to watch at a

NOTE Confidence: 0.912698818333333

00:22:16.239 --> 00:22:18.053 given point in time is affected not

NOTE Confidence: 0.912698818333333

00:22:18.053 --> 00:22:20.105 only by its own experience but by

NOTE Confidence: 0.912698818333333

00:22:20.105 --> 00:22:22.000 the experiences in previous generations.

NOTE Confidence: 0.912698818333333

00:22:22.000 --> 00:22:25.366 So I already told you that.

NOTE Confidence: 0.912698818333333

00:22:25.370 --> 00:22:27.115 But this has major consequences

NOTE Confidence: 0.912698818333333

00:22:27.115 --> 00:22:28.860 for the the currency of

NOTE Confidence: 0.827512293333333

00:22:28.927 --> 00:22:31.084 Darwinian fitness, right lifetime,

NOTE Confidence: 0.827512293333333

00:22:31.084 --> 00:22:32.098 reproductive success,

NOTE Confidence: 0.827512293333333

00:22:32.098 --> 00:22:34.601 how many offspring females leave behind.

NOTE Confidence: 0.827512293333333

00:22:34.601 --> 00:22:36.563 So this raises a natural question

NOTE Confidence: 0.827512293333333

00:22:36.563 --> 00:22:38.340 about why these early life effects

NOTE Confidence: 0.827512293333333

00:22:38.340 --> 00:22:40.110 have evolved in the 1st place.

NOTE Confidence: 0.827512293333333

00:22:40.110 --> 00:22:42.680 If this has such costly

NOTE Confidence: 0.827512293333333

00:22:42.680 --> 00:22:44.321 consequences for fitness,

NOTE Confidence: 0.827512293333333

00:22:44.321 --> 00:22:47.603 then shouldn't over the course of

NOTE Confidence: 0.827512293333333

00:22:47.603 --> 00:22:49.990 evolutionary history we and other

NOTE Confidence: 0.827512293333333

00:22:49.990 --> 00:22:52.185 longer lived primates you know,

NOTE Confidence: 0.827512293333333

00:22:52.190 --> 00:22:53.922 quit paying attention to

NOTE Confidence: 0.827512293333333

00:22:53.922 --> 00:22:55.654 those early life experiences.

NOTE Confidence: 0.827512293333333

00:22:55.660 --> 00:22:56.908 This was a question that a

NOTE Confidence: 0.827512293333333

00:22:56.908 --> 00:22:58.000 former PhD student of mine,

NOTE Confidence: 0.827512293333333

00:22:58.000 --> 00:22:58.880 Amanda Lea,

NOTE Confidence: 0.827512293333333

00:22:58.880 --> 00:23:01.080 is now faculty at Vanderbilt

NOTE Confidence: 0.827512293333333

00:23:01.080 --> 00:23:02.700 was very interested in,

NOTE Confidence: 0.827512293333333

00:23:02.700 --> 00:23:05.490 and she attempted to disentangle 2

NOTE Confidence: 0.827512293333333

00:23:05.490 --> 00:23:07.856 of the predominant hypothesis for

NOTE Confidence: 0.827512293333333

00:23:07.856 --> 00:23:09.976 why early life effects evolved.

NOTE Confidence: 0.827512293333333

00:23:09.980 --> 00:23:12.002 These are often used to explain

NOTE Confidence: 0.827512293333333

00:23:12.002 --> 00:23:14.119 early life effects in humans too,

NOTE Confidence: 0.827512293333333

00:23:14.120 --> 00:23:16.780 so I think that there is some

NOTE Confidence: 0.827512293333333

00:23:16.780 --> 00:23:19.498 some generalizability here.

NOTE Confidence: 0.827512293333333

00:23:19.500 --> 00:23:22.212 The 1st is a class of of explanations

NOTE Confidence: 0.827512293333333

00:23:22.212 --> 00:23:25.018 I'll refer to as early life programming,

NOTE Confidence: 0.827512293333333

00:23:25.020 --> 00:23:25.636 adaptive programming,

NOTE Confidence: 0.827512293333333

00:23:25.636 --> 00:23:26.868 or sometimes you'll see.

NOTE Confidence: 0.827512293333333

00:23:26.870 --> 00:23:29.366 Adaptive responses which posits

NOTE Confidence: 0.827512293333333

00:23:29.366 --> 00:23:33.538 that what's going on is that young

NOTE Confidence: 0.827512293333333

00:23:33.538 --> 00:23:36.106 animals are taking cues from their

NOTE Confidence: 0.827512293333333

00:23:36.106 --> 00:23:38.204 environment to adjust their phenotype

NOTE Confidence: 0.827512293333333

00:23:38.204 --> 00:23:40.436 in a way that better prepares

NOTE Confidence: 0.827512293333333

00:23:40.436 --> 00:23:42.551 them for a similar environmental

NOTE Confidence: 0.827512293333333

00:23:42.551 --> 00:23:44.706 exposure later in Life OK,

NOTE Confidence: 0.827512293333333

00:23:44.710 --> 00:23:47.338 and so if you use these kind of fitness

NOTE Confidence: 0.827512293333333

00:23:47.338 --> 00:23:50.150 nor sorry reaction norm representations,

NOTE Confidence: 0.827512293333333

00:23:50.150 --> 00:23:51.938 what that means is that individuals

NOTE Confidence: 0.827512293333333

00:23:51.938 --> 00:23:54.298 who are born in a poor early

NOTE Confidence: 0.827512293333333

00:23:54.298 --> 00:23:55.770 environment actually do better.

NOTE Confidence: 0.827512293333333

00:23:55.770 --> 00:23:57.216 If the quality of the environment.

NOTE Confidence: 0.827512293333333

00:23:57.220 --> 00:24:00.060 Is also poor in adulthood and vice versa.

NOTE Confidence: 0.827512293333333

00:24:00.060 --> 00:24:02.526 Individuals who are born in a

NOTE Confidence: 0.827512293333333

00:24:02.526 --> 00:24:04.170 benign environment do better

NOTE Confidence: 0.827512293333333

00:24:04.243 --> 00:24:06.835 in an environment that are high

NOTE Confidence: 0.827512293333333

00:24:06.835 --> 00:24:09.052 quality in adulthood relative to

NOTE Confidence: 0.827512293333333

00:24:09.052 --> 00:24:11.117 that other class of individuals.

NOTE Confidence: 0.827512293333333

00:24:11.120 --> 00:24:13.058 A major alternative class of hypothesis

NOTE Confidence: 0.827512293333333

00:24:13.058 --> 00:24:15.254 is what is often termed developmental

NOTE Confidence: 0.827512293333333

00:24:15.254 --> 00:24:17.768 constraints or a silver spoon effect,

NOTE Confidence: 0.827512293333333

00:24:17.770 --> 00:24:20.798 which basically posits that good

NOTE Confidence: 0.827512293333333

00:24:20.798 --> 00:24:22.862 benign early environments are

NOTE Confidence: 0.827512293333333

00:24:22.862 --> 00:24:25.570 good for you no matter what your

NOTE Confidence: 0.827512293333333

00:24:25.570 --> 00:24:26.730 adult environment looks like,

NOTE Confidence: 0.827512293333333

00:24:26.730 --> 00:24:30.090 and so the consequences of early

NOTE Confidence: 0.827512293333333

00:24:30.090 --> 00:24:32.330 life adversity are because.

NOTE Confidence: 0.827512293333333

00:24:32.330 --> 00:24:33.610 Individuals have to physiologically

NOTE Confidence: 0.827512293333333

00:24:33.610 --> 00:24:34.890 adapt to their environment,

NOTE Confidence: 0.827512293333333

00:24:34.890 --> 00:24:36.414 and they're basically making

NOTE Confidence: 0.827512293333333

00:24:36.414 --> 00:24:38.700 the best of a bad job.

NOTE Confidence: 0.827512293333333

00:24:38.700 --> 00:24:41.112 A real challenge with distinguishing these

NOTE Confidence: 0.827512293333333

00:24:41.112 --> 00:24:43.578 between these two hypothesis is that often,

NOTE Confidence: 0.827512293333333

00:24:43.580 --> 00:24:46.020 particularly in human natural experiments,

NOTE Confidence: 0.827512293333333

00:24:46.020 --> 00:24:48.084 what we what we have our data from.

NOTE Confidence: 0.827512293333333

00:24:48.090 --> 00:24:50.060 Individuals born in poor versus

NOTE Confidence: 0.827512293333333

00:24:50.060 --> 00:24:51.636 high quality early environments.

NOTE Confidence: 0.827512293333333

00:24:51.640 --> 00:24:52.720 You can think about classical

NOTE Confidence: 0.827512293333333

00:24:52.720 --> 00:24:53.800 studies like the Dutch hunger,

NOTE Confidence: 0.827512293333333

00:24:53.800 --> 00:24:56.832 winter or the Great Leap

NOTE Confidence: 0.827512293333333

00:24:56.832 --> 00:24:58.124 Forward studies in China,

NOTE Confidence: 0.827512293333333

00:24:58.130 --> 00:25:00.020 but they're measured in adulthood

NOTE Confidence: 0.827512293333333

00:25:00.020 --> 00:25:01.532 in relatively benign environments.

NOTE Confidence: 0.827512293333333

00:25:01.540 --> 00:25:02.233 In other words,

NOTE Confidence: 0.827512293333333

00:25:02.233 --> 00:25:03.619 we're seeing two of these points,

NOTE Confidence: 0.827512293333333

00:25:03.620 --> 00:25:04.790 not four of these points,

NOTE Confidence: 0.827512293333333

00:25:04.790 --> 00:25:06.126 and if you only see two of these

NOTE Confidence: 0.827512293333333

00:25:06.126 --> 00:25:07.299 points on the right hand side,

NOTE Confidence: 0.827512293333333

00:25:07.300 --> 00:25:08.932 you can't actually distinguish.

NOTE Confidence: 0.827512293333333

00:25:08.932 --> 00:25:10.564 Between that crossing pattern,

NOTE Confidence: 0.827512293333333

00:25:10.570 --> 00:25:12.712 that interaction pattern or a pattern

NOTE Confidence: 0.827512293333333

00:25:12.712 --> 00:25:15.402 that would be much more consistent

NOTE Confidence: 0.827512293333333

00:25:15.402 --> 00:25:17.199 with developmental constraints.

NOTE Confidence: 0.827512293333333

00:25:17.200 --> 00:25:19.584 So we think we can do this in

NOTE Confidence: 0.827512293333333

00:25:19.584 --> 00:25:21.783 Amboseli because there is a major

NOTE Confidence: 0.827512293333333

00:25:21.783 --> 00:25:23.315 source of environmental variation

NOTE Confidence: 0.827512293333333

00:25:23.315 --> 00:25:25.910 that can cause hardship or relative

NOTE Confidence: 0.827512293333333

00:25:25.910 --> 00:25:27.674 advantage that is completely

NOTE Confidence: 0.827512293333333

00:25:27.674 --> 00:25:29.568 exogenous to the fabulous themselves,

NOTE Confidence: 0.827512293333333

00:25:29.568 --> 00:25:31.248 and that's simply defined by

NOTE Confidence: 0.827512293333333

00:25:31.248 --> 00:25:33.060 patterns of rainfall in Amboseli,

NOTE Confidence: 0.827512293333333

00:25:33.060 --> 00:25:35.499 which can be quite dry in some years less

NOTE Confidence: 0.827512293333333

00:25:35.499 --> 00:25:37.899 than rainfall in Phoenix for comparison.

NOTE Confidence: 0.827512293333333

00:25:37.900 --> 00:25:39.650 So desert like these are

NOTE Confidence: 0.827512293333333

00:25:39.650 --> 00:25:41.400 hydrological years going back into

NOTE Confidence: 0.859227986666667

00:25:41.465 --> 00:25:44.688 the 70s, or they can be relatively high,

NOTE Confidence: 0.859227986666667

00:25:44.690 --> 00:25:45.920 not as high as New Haven.

NOTE Confidence: 0.859227986666667

00:25:45.920 --> 00:25:46.712 In case you're interested

NOTE Confidence: 0.859227986666667

00:25:46.712 --> 00:25:47.702 in putting this in context,

NOTE Confidence: 0.859227986666667

00:25:47.710 --> 00:25:49.422 New Haven get spelled.

NOTE Confidence: 0.859227986666667

00:25:49.422 --> 00:25:51.990 1200 millimeters of precipitation a year,

NOTE Confidence: 0.859227986666667

00:25:51.990 --> 00:25:54.111 but high enough that we aren't talking

NOTE Confidence: 0.859227986666667

00:25:54.111 --> 00:25:56.110 about desert like conditions anymore.

NOTE Confidence: 0.859227986666667

00:25:56.110 --> 00:25:58.542 OK, and of course this variation again is

NOTE Confidence: 0.859227986666667

00:25:58.542 --> 00:26:00.510 something that the baboon like baboons,

NOTE Confidence: 0.859227986666667

00:26:00.510 --> 00:26:03.654 nor we have any kind of control over.

NOTE Confidence: 0.859227986666667

00:26:03.660 --> 00:26:05.508 Now in 2009 we had the equivalent

NOTE Confidence: 0.859227986666667

00:26:05.508 --> 00:26:07.773 of a weight of a natural experiment

NOTE Confidence: 0.859227986666667

00:26:07.773 --> 00:26:09.533 in our own natural population,

NOTE Confidence: 0.859227986666667

00:26:09.540 --> 00:26:11.619 which was the worst drought ever recorded

NOTE Confidence: 0.859227986666667

00:26:11.619 --> 00:26:13.529 in the history of this ecosystem,

NOTE Confidence: 0.859227986666667

00:26:13.530 --> 00:26:15.595 and it was compounded by the fact

NOTE Confidence: 0.859227986666667

00:26:15.595 --> 00:26:17.554 that the year before 2008 was

NOTE Confidence: 0.859227986666667

00:26:17.554 --> 00:26:19.426 actually also a low rainfall year,

NOTE Confidence: 0.859227986666667

00:26:19.430 --> 00:26:20.955 so animals were really suffering

NOTE Confidence: 0.859227986666667

00:26:20.955 --> 00:26:21.870 in the basin.

NOTE Confidence: 0.859227986666667

00:26:21.870 --> 00:26:23.550 There was large scale die

NOTE Confidence: 0.859227986666667

00:26:23.550 --> 00:26:24.894 off of large animals.

NOTE Confidence: 0.859227986666667

00:26:24.900 --> 00:26:28.260 We did not see a lot of mortality

NOTE Confidence: 0.859227986666667

00:26:28.260 --> 00:26:29.514 consequences in the baboons,

NOTE Confidence: 0.859227986666667

00:26:29.514 --> 00:26:32.389 but we did see a huge drop in fertility.

NOTE Confidence: 0.859227986666667

00:26:32.390 --> 00:26:34.058 So here on the Y axis.

NOTE Confidence: 0.859227986666667

00:26:34.060 --> 00:26:36.846 I'm showing you rates of conception per

NOTE Confidence: 0.859227986666667

00:26:36.846 --> 00:26:39.798 adult female by hydrological year and this

NOTE Confidence: 0.859227986666667

00:26:39.798 --> 00:26:42.610 is 2009 where it dropped by about 25%.

NOTE Confidence: 0.859227986666667

00:26:42.610 --> 00:26:44.830 So the animals are very much

NOTE Confidence: 0.859227986666667

00:26:44.830 --> 00:26:46.780 feeling these kinds of effects,

NOTE Confidence: 0.859227986666667

00:26:46.780 --> 00:26:49.678 so this gave us the ability to ask in

NOTE Confidence: 0.859227986666667

00:26:49.678 --> 00:26:53.068 a poor quality adult environment 2009

NOTE Confidence: 0.859227986666667

00:26:53.068 --> 00:26:55.558 versus good quality adult environments.

NOTE Confidence: 0.859227986666667

00:26:55.560 --> 00:26:58.605 So the middle 50% of rainfall years

NOTE Confidence: 0.859227986666667

00:26:58.605 --> 00:27:00.500 were treating in that sort of way.

NOTE Confidence: 0.859227986666667

00:27:00.500 --> 00:27:01.541 In this analysis,

NOTE Confidence: 0.859227986666667

00:27:01.541 --> 00:27:04.360 how did individuals who were born in poor?

NOTE Confidence: 0.859227986666667

00:27:04.360 --> 00:27:06.555 Early environments during early life

NOTE Confidence: 0.859227986666667

00:27:06.555 --> 00:27:09.222 droughts do compared to individuals born

NOTE Confidence: 0.859227986666667

00:27:09.222 --> 00:27:11.676 in modern high quality early environments.

NOTE Confidence: 0.859227986666667

00:27:11.680 --> 00:27:14.585 In terms of their ability to conceive

NOTE Confidence: 0.859227986666667

00:27:14.585 --> 00:27:20.460 offspring and also to resume reproductive.

NOTE Confidence: 0.859227986666667

00:27:20.460 --> 00:27:24.030 Cycling after a period of postpartum minaria.

NOTE Confidence: 0.859227986666667

00:27:24.030 --> 00:27:24.558 OK,

NOTE Confidence: 0.859227986666667

00:27:24.558 --> 00:27:27.726 so that's what we'll focus on.

NOTE Confidence: 0.859227986666667

00:27:27.730 --> 00:27:29.118 These fertility related outcomes.

NOTE Confidence: 0.859227986666667

00:27:29.118 --> 00:27:31.790 And here's what we get as a result.

NOTE Confidence: 0.859227986666667

00:27:31.790 --> 00:27:34.436 What we find is that for females who are

NOTE Confidence: 0.859227986666667

00:27:34.436 --> 00:27:37.027 born in relatively benign environments,

NOTE Confidence: 0.859227986666667

00:27:37.030 --> 00:27:39.282 there's actually very little

NOTE Confidence: 0.859227986666667

00:27:39.282 --> 00:27:41.814 difference in their probability of

NOTE Confidence: 0.859227986666667

00:27:41.814 --> 00:27:43.686 conceiving or resuming cycling.

NOTE Confidence: 0.859227986666667

00:27:43.690 --> 00:27:45.350 This is conception data.

NOTE Confidence: 0.859227986666667

00:27:45.350 --> 00:27:48.790 Here in moderate years versus in the drought.

NOTE Confidence: 0.859227986666667

00:27:48.790 --> 00:27:49.894 They're relatively buffered,

NOTE Confidence: 0.859227986666667

00:27:49.894 --> 00:27:53.259 although you see a little bit of a decrement.

NOTE Confidence: 0.859227986666667

00:27:53.260 --> 00:27:55.450 This is actually a comparison within

NOTE Confidence: 0.859227986666667

00:27:55.450 --> 00:27:57.637 individuals for for females who conceived

NOTE Confidence: 0.859227986666667

00:27:57.637 --> 00:27:59.982 in both of those types of environments,

NOTE Confidence: 0.859227986666667

00:27:59.990 --> 00:28:01.940 so these comparisons are going

NOTE Confidence: 0.859227986666667

00:28:01.940 --> 00:28:03.890 to be centered around 0,

NOTE Confidence: 0.859227986666667

00:28:03.890 --> 00:28:05.440 whereas for females who were

NOTE Confidence: 0.859227986666667

00:28:05.440 --> 00:28:06.370 born during droughts,

NOTE Confidence: 0.859227986666667

00:28:06.370 --> 00:28:08.547 they took a much larger hit in

NOTE Confidence: 0.859227986666667

00:28:08.547 --> 00:28:10.406 comparison to their own reproductive

NOTE Confidence: 0.859227986666667

00:28:10.406 --> 00:28:12.974 performance and mop in moderate years.

NOTE Confidence: 0.859227986666667

00:28:12.980 --> 00:28:13.820 In other words,

NOTE Confidence: 0.859227986666667

00:28:13.820 --> 00:28:15.780 there is a difference between how well

NOTE Confidence: 0.859227986666667

00:28:15.837 --> 00:28:17.832 females who were born and droughts and

NOTE Confidence: 0.859227986666667

00:28:17.832 --> 00:28:19.940 females who were born in good years did,

NOTE Confidence: 0.859227986666667

00:28:19.940 --> 00:28:21.956 but is in the opposite direction

NOTE Confidence: 0.859227986666667

00:28:21.956 --> 00:28:23.939 as predicted by the predictive

NOTE Confidence: 0.859227986666667

00:28:23.939 --> 00:28:25.637 adaptive response model.

NOTE Confidence: 0.859227986666667

00:28:25.640 --> 00:28:27.090 We actually also see some,

NOTE Confidence: 0.859227986666667

00:28:27.090 --> 00:28:29.085 some some preliminary evidence for

NOTE Confidence: 0.859227986666667

00:28:29.085 --> 00:28:31.080 social buffering in this situation

NOTE Confidence: 0.859227986666667

00:28:31.147 --> 00:28:33.323 for females who were both born in a

NOTE Confidence: 0.859227986666667

00:28:33.323 --> 00:28:35.464 drought and lived as reproductive adults

NOTE Confidence: 0.859227986666667

00:28:35.464 --> 00:28:37.896 through that very severe 2009 drought,

NOTE Confidence: 0.859227986666667

00:28:37.896 --> 00:28:41.480 we find that females were able to maintain

NOTE Confidence: 0.859227986666667

00:28:41.567 --> 00:28:44.710 their ability to conceive if they were

NOTE Confidence: 0.859227986666667

00:28:44.710 --> 00:28:46.990 born to high status mothers versus

NOTE Confidence: 0.859227986666667

00:28:46.990 --> 00:28:49.375 females who were born to low status.

NOTE Confidence: 0.826622907272727

00:28:49.380 --> 00:28:52.008 Mothers were less able to buffer

NOTE Confidence: 0.826622907272727

00:28:52.008 --> 00:28:54.210 her against these multiple hits.

NOTE Confidence: 0.826622907272727

00:28:54.210 --> 00:28:55.754 And so you know, Amanda came to me.

NOTE Confidence: 0.826622907272727

00:28:55.760 --> 00:28:57.470 And she found this result.

NOTE Confidence: 0.826622907272727

00:28:57.470 --> 00:28:59.045 She said, well, I think all we're

NOTE Confidence: 0.826622907272727

00:28:59.045 --> 00:29:00.799 saying is that if you were born in

NOTE Confidence: 0.826622907272727

00:29:00.799 --> 00:29:02.336 a terrible year and then you had

NOTE Confidence: 0.826622907272727

00:29:02.336 --> 00:29:03.704 the bad luck of living through,

NOTE Confidence: 0.826622907272727

00:29:03.710 --> 00:29:05.456 you know one of the worst years on record.

NOTE Confidence: 0.826622907272727

00:29:05.460 --> 00:29:08.670 And you know you are.

NOTE Confidence: 0.826622907272727

00:29:08.670 --> 00:29:09.735 Experiencing social disadvantage

NOTE Confidence: 0.826622907272727

00:29:09.735 --> 00:29:12.580 is the result of being low on a

NOTE Confidence: 0.826622907272727

00:29:12.580 --> 00:29:14.350 social hierarchy than that is bad.

NOTE Confidence: 0.826622907272727

00:29:14.350 --> 00:29:15.154 And that's true.

NOTE Confidence: 0.826622907272727

00:29:15.154 --> 00:29:17.070 I mean, maybe that's not very surprising,

NOTE Confidence: 0.826622907272727

00:29:17.070 --> 00:29:19.761 but the fact is it is counter to one

NOTE Confidence: 0.826622907272727

00:29:19.761 --> 00:29:22.629 of the dominant predictions in the

NOTE Confidence: 0.826622907272727

00:29:22.629 --> 00:29:25.740 literature about why these things happen.

NOTE Confidence: 0.826622907272727

00:29:25.740 --> 00:29:26.150 So

NOTE Confidence: 0.591490706

00:29:26.740 --> 00:29:27.540 you're going on to that.

NOTE Confidence: 0.591490706

00:29:27.540 --> 00:29:28.856 There's just a little bit of *********

NOTE Confidence: 0.591490706

00:29:28.860 --> 00:29:30.396 that we're hearing from the audio.

NOTE Confidence: 0.591490706

00:29:30.400 --> 00:29:32.242 I'm wondering if there's anything with

NOTE Confidence: 0.591490706

00:29:32.242 --> 00:29:34.025 your microphone or something on your

NOTE Confidence: 0.591490706

00:29:34.025 --> 00:29:35.537 microphone that we could try moving,

NOTE Confidence: 0.591490706

00:29:35.540 --> 00:29:37.756 and it's not. It's not too too bad,

NOTE Confidence: 0.591490706

00:29:37.760 --> 00:29:39.804 it's just a little bit of *********.

NOTE Confidence: 0.802217362857143

00:29:40.320 --> 00:29:42.432 OK, I can probably switch my

NOTE Confidence: 0.802217362857143

00:29:42.432 --> 00:29:43.708 microphone. This may switch.

NOTE Confidence: 0.7869168025

00:29:46.000 --> 00:29:47.400 This may switch the image

NOTE Confidence: 0.7869168025

00:29:47.400 --> 00:29:49.088 for a SEK, so bear with me.

NOTE Confidence: 0.809811013333333

00:29:50.120 --> 00:29:51.380 Sorry to interrupt you. I just

NOTE Confidence: 0.859348397777778

00:29:51.410 --> 00:29:53.732 Oh no, no problem. It's better

NOTE Confidence: 0.859348397777778

00:29:53.732 --> 00:29:55.928 to to actually be able to hear

NOTE Confidence: 0.770058035714286

00:29:56.120 --> 00:29:58.282 we can. We can hear you fine. It's just

NOTE Confidence: 0.770058035714286

00:29:58.282 --> 00:30:00.090 a little bit of of of of *********.

NOTE Confidence: 0.822665881666667

00:30:00.580 --> 00:30:02.302 OK yeah I'm going to switch

NOTE Confidence: 0.822665881666667

00:30:02.302 --> 00:30:04.330 mikes in just a second once.

NOTE Confidence: 0.91811237875

00:30:05.570 --> 00:30:07.154 Just as you did your shadow to Amanda,

NOTE Confidence: 0.91811237875

00:30:07.160 --> 00:30:08.220 I thought that was a knife, nice.

NOTE Confidence: 0.8292339

00:30:09.740 --> 00:30:12.350 Correct, OK? Are you seeing a

NOTE Confidence: 0.8292339

00:30:12.350 --> 00:30:15.370 presenter view now or are you seeing

NOTE Confidence: 0.607020261666667

00:30:15.880 --> 00:30:17.620 no? We're seeing a blank screen?

NOTE Confidence: 0.607020261666667

00:30:17.620 --> 00:30:20.007 Well, just seeing a square of white

NOTE Confidence: 0.827297339090909

00:30:20.520 --> 00:30:22.235 square of white, that's not

NOTE Confidence: 0.827297339090909

00:30:22.235 --> 00:30:24.740 what I want to show you, OK?

NOTE Confidence: 0.727680142857143

00:30:26.420 --> 00:30:27.420 Yeah, the baboon pictures

NOTE Confidence: 0.727680142857143

00:30:27.420 --> 00:30:28.770 are far more preferable.

NOTE Confidence: 0.939946548888889

00:30:30.140 --> 00:30:31.607 Let me let me try and work on that.

NOTE Confidence: 0.608122807142857

00:30:31.660 --> 00:30:33.249 I can probably go. We've got him.

NOTE Confidence: 0.608122807142857

00:30:33.250 --> 00:30:37.820 Now we can see your slides, but just OK.

NOTE Confidence: 0.8438150775

00:30:37.820 --> 00:30:40.956 And then let me go back to zoom.

NOTE Confidence: 0.8438150775

00:30:40.960 --> 00:30:42.864 I'm gonna stop share for just a second.

NOTE Confidence: 0.8438150775

00:30:42.870 --> 00:30:44.670 I just fix this problem.

NOTE Confidence: 0.8438150775

00:30:44.670 --> 00:30:46.070 Sorry about that Dani.

NOTE Confidence: 0.8438150775

00:30:46.070 --> 00:30:47.070 No no, no that's OK.

NOTE Confidence: 0.8438150775

00:30:47.070 --> 00:30:48.070 Thank you for telling me.

NOTE Confidence: 0.40966004

00:30:50.950 --> 00:30:51.210 OK.

NOTE Confidence: 0.90149472625

00:30:55.130 --> 00:30:56.970 OK, I've just switched.

NOTE Confidence: 0.90149472625

00:30:56.970 --> 00:30:58.810 Microphones is that better?

NOTE Confidence: 0.787057286

00:30:59.220 --> 00:31:00.370 We don't hear any *********

NOTE Confidence: 0.787057286

00:31:00.370 --> 00:31:01.010 at the moment then.

NOTE Confidence: 0.6000819475

00:31:01.070 --> 00:31:03.398 OK, great and then.

NOTE Confidence: 0.68643683

00:31:05.910 --> 00:31:09.030 Go back to the screen share, oops.

NOTE Confidence: 0.948924313333333

00:31:18.020 --> 00:31:20.108 OK, are you seeing my slides?

NOTE Confidence: 0.623313266666667

00:31:20.280 --> 00:31:23.238 We can see your Internet actually.

NOTE Confidence: 0.623313266666667

00:31:23.240 --> 00:31:24.626 Yeah now we can see your slides

NOTE Confidence: 0.816111203846154

00:31:25.500 --> 00:31:27.229 and it looks like the way it's

NOTE Confidence: 0.816111203846154

00:31:27.229 --> 00:31:29.000 supposed to and not not presented.

NOTE Confidence: 0.816111203846154

00:31:29.000 --> 00:31:30.020 It looks great.

NOTE Confidence: 0.816111203846154

00:31:30.020 --> 00:31:32.738 OK perfect, thanks so much no problem.

NOTE Confidence: 0.816111203846154

00:31:32.738 --> 00:31:35.873 So I think the evidence that we have is

NOTE Confidence: 0.816111203846154

00:31:35.873 --> 00:31:38.459 against the idea of adaptive programming,

NOTE Confidence: 0.816111203846154

00:31:38.460 --> 00:31:41.624 but much more easily explained

NOTE Confidence: 0.816111203846154

00:31:41.624 --> 00:31:42.920 by contingently experience,

NOTE Confidence: 0.816111203846154

00:31:42.920 --> 00:31:45.130 developmental constraints in other words.

NOTE Confidence: 0.816111203846154

00:31:45.130 --> 00:31:47.236 Females who are born in a

NOTE Confidence: 0.816111203846154

00:31:47.236 --> 00:31:48.289 disadvantageous environment do

NOTE Confidence: 0.816111203846154

00:31:48.289 --> 00:31:50.394 worse even in that same type of dis,

NOTE Confidence: 0.816111203846154

00:31:50.400 --> 00:31:52.184 and fit advantageous environment

NOTE Confidence: 0.816111203846154

00:31:52.184 --> 00:31:53.968 when they grow up.

NOTE Confidence: 0.816111203846154

00:31:53.970 --> 00:31:56.394 We actually don't see those effects

NOTE Confidence: 0.816111203846154

00:31:56.394 --> 00:31:58.859 in moderate years and for females

NOTE Confidence: 0.816111203846154

00:31:58.859 --> 00:32:01.193 who were born in moderate years.

NOTE Confidence: 0.816111203846154

00:32:01.200 --> 00:32:03.993 The effect is is much attenuated relative

NOTE Confidence: 0.816111203846154

00:32:03.993 --> 00:32:08.662 to females who were born in in dry years.

NOTE Confidence: 0.816111203846154

00:32:08.662 --> 00:32:09.350 Additionally,

NOTE Confidence: 0.816111203846154

00:32:09.350 --> 00:32:11.060 there are other sources of relative

NOTE Confidence: 0.816111203846154

00:32:11.060 --> 00:32:12.466 advantage in diversity that can

NOTE Confidence: 0.816111203846154

00:32:12.466 --> 00:32:13.744 have the same kind of effect,

NOTE Confidence: 0.816111203846154

00:32:13.750 --> 00:32:16.930 including being born to a relatively

NOTE Confidence: 0.816111203846154

00:32:16.930 --> 00:32:19.590 socially privileged family.

NOTE Confidence: 0.816111203846154

00:32:19.590 --> 00:32:22.134 OK, and I'll just note that this is

NOTE Confidence: 0.816111203846154

00:32:22.134 --> 00:32:24.360 fairly consistent with the pattern that I

NOTE Confidence: 0.816111203846154

00:32:24.360 --> 00:32:26.790 think is emerging from long lived species,

NOTE Confidence: 0.816111203846154

00:32:26.790 --> 00:32:28.974 including humans that because

NOTE Confidence: 0.816111203846154

00:32:28.974 --> 00:32:31.704 of our very long lives,

NOTE Confidence: 0.816111203846154

00:32:31.710 --> 00:32:34.244 setting a strong, making a strong bet,

NOTE Confidence: 0.816111203846154

00:32:34.250 --> 00:32:36.320 making a strong prediction from

NOTE Confidence: 0.816111203846154

00:32:36.320 --> 00:32:38.390 an experience in in utero,

NOTE Confidence: 0.816111203846154

00:32:38.390 --> 00:32:41.449 or in the first years of life,

NOTE Confidence: 0.816111203846154

00:32:41.450 --> 00:32:44.594 is probably not wise for animals that live,

NOTE Confidence: 0.816111203846154

00:32:44.600 --> 00:32:45.710 you know, decades,

NOTE Confidence: 0.816111203846154

00:32:45.710 --> 00:32:47.930 whereas it may be very wise

NOTE Confidence: 0.816111203846154

00:32:47.930 --> 00:32:49.723 for a water free or.

NOTE Confidence: 0.816111203846154

00:32:49.723 --> 00:32:51.988 Or for a tobacco hornworms?

NOTE Confidence: 0.816111203846154

00:32:51.990 --> 00:32:52.499 OK.

NOTE Confidence: 0.816111203846154

00:32:52.499 --> 00:32:56.571 So finally I think one of the biggest

NOTE Confidence: 0.816111203846154

00:32:56.571 --> 00:32:58.835 puzzles that is of shared interest

NOTE Confidence: 0.816111203846154

00:32:58.835 --> 00:33:00.665 to people interested in early life

NOTE Confidence: 0.816111203846154

00:33:00.665 --> 00:33:02.324 effects is of course this very

NOTE Confidence: 0.816111203846154

00:33:02.324 --> 00:33:04.247 general question of how where we can

NOTE Confidence: 0.816111203846154

00:33:04.247 --> 00:33:05.957 be talking about multiple types of

NOTE Confidence: 0.816111203846154

00:33:05.957 --> 00:33:07.835 different types of mechanisms from

NOTE Confidence: 0.816111203846154

00:33:07.835 --> 00:33:09.575 social and behavioral mechanisms

NOTE Confidence: 0.816111203846154

00:33:09.575 --> 00:33:11.595 to biological mechanisms that are

NOTE Confidence: 0.816111203846154

00:33:11.595 --> 00:33:13.551 adjusted based on the early life

NOTE Confidence: 0.816111203846154

00:33:13.551 --> 00:33:15.486 environment and one of the puzzling

NOTE Confidence: 0.816111203846154

00:33:15.486 --> 00:33:17.555 things about relating early life

NOTE Confidence: 0.816111203846154

00:33:17.555 --> 00:33:19.495 adversity to phenotypic outcomes

NOTE Confidence: 0.816111203846154

00:33:19.495 --> 00:33:22.491 later in life is that they don't

NOTE Confidence: 0.816111203846154

00:33:22.491 --> 00:33:24.425 affect you know single types of

NOTE Confidence: 0.816111203846154

00:33:24.425 --> 00:33:25.990 outcomes with very clear ideology.

NOTE Confidence: 0.816111203846154

00:33:25.990 --> 00:33:28.503 But rather tend to have very general

NOTE Confidence: 0.816111203846154

00:33:28.503 --> 00:33:31.064 effects on a lot of different

NOTE Confidence: 0.816111203846154

00:33:31.064 --> 00:33:33.878 outcomes that have lots of different

NOTE Confidence: 0.816111203846154

00:33:33.878 --> 00:33:35.230 underlying mechanisms.

NOTE Confidence: 0.816111203846154

00:33:35.230 --> 00:33:37.967 So I think a common and influential

NOTE Confidence: 0.816111203846154

00:33:37.967 --> 00:33:41.721 idea about how this works is through a

NOTE Confidence: 0.816111203846154

00:33:41.721 --> 00:33:44.221 general process of biological embedding.

NOTE Confidence: 0.816111203846154

00:33:44.230 --> 00:33:46.474 And here I'm using the criteria

NOTE Confidence: 0.816111203846154

00:33:46.474 --> 00:33:47.596 defined by herzman,

NOTE Confidence: 0.816111203846154

00:33:47.600 --> 00:33:50.666 where the environment somehow you know,

NOTE Confidence: 0.816111203846154

00:33:50.670 --> 00:33:52.565 influences what's going on under

NOTE Confidence: 0.816111203846154

00:33:52.565 --> 00:33:55.114 the skin is at the physiological

NOTE Confidence: 0.816111203846154

00:33:55.114 --> 00:33:57.969 and molecular level to influence

NOTE Confidence: 0.816111203846154

00:33:57.970 --> 00:34:00.462 biological and developmental processes,

NOTE Confidence: 0.816111203846154

00:34:00.462 --> 00:34:02.954 meaning that systematic differences

NOTE Confidence: 0.816111203846154

00:34:02.954 --> 00:34:05.389 in experience like being born.

NOTE Confidence: 0.816111203846154

00:34:05.390 --> 00:34:07.538 Two in a low resource environment

NOTE Confidence: 0.816111203846154

00:34:07.538 --> 00:34:09.526 and an environment that produces

NOTE Confidence: 0.816111203846154

00:34:09.526 --> 00:34:11.486 material deprivation or social

NOTE Confidence: 0.816111203846154

00:34:11.486 --> 00:34:13.936 deprivation can lead to systematically

NOTE Confidence: 0.816111203846154

00:34:14.003 --> 00:34:15.719 different types of biological

NOTE Confidence: 0.816111203846154

00:34:15.719 --> 00:34:18.812 states that remain stable overtime.

NOTE Confidence: 0.816111203846154

00:34:18.812 --> 00:34:21.524 And crucially, to actually mediate,

NOTE Confidence: 0.816111203846154

00:34:21.524 --> 00:34:25.169 you know this sort of bubble on the left.

NOTE Confidence: 0.816111203846154

00:34:25.170 --> 00:34:26.730 At the relationship with bubble on

NOTE Confidence: 0.816111203846154

00:34:26.730 --> 00:34:28.848 the left and the bubble on the right,

NOTE Confidence: 0.816111203846154

00:34:28.850 --> 00:34:29.676 these differences,

NOTE Confidence: 0.816111203846154

00:34:29.676 --> 00:34:31.741 whatever changes at that molecular

NOTE Confidence: 0.816111203846154

00:34:31.741 --> 00:34:32.980 and physiological level,

NOTE Confidence: 0.816111203846154

00:34:32.980 --> 00:34:35.638 must have the capacity to influence

NOTE Confidence: 0.816111203846154

00:34:35.638 --> 00:34:38.370 trait variation over the life course.

NOTE Confidence: 0.816111203846154

00:34:38.370 --> 00:34:43.458 For those interested in social epigenetics,

NOTE Confidence: 0.816111203846154

00:34:43.460 --> 00:34:45.724 much of this much of the attention to

NOTE Confidence: 0.816111203846154

00:34:45.724 --> 00:34:47.569 a potential mechanism has therefore

NOTE Confidence: 0.816111203846154

00:34:47.569 --> 00:34:49.916 focused on the epigenome, and for both,

NOTE Confidence: 0.816111203846154

00:34:49.916 --> 00:34:51.126 I think reasons of measurement,

NOTE Confidence: 0.853549673076923

00:34:51.130 --> 00:34:55.316 and because DNA methylation is a relatively

NOTE Confidence: 0.853549673076923

00:34:55.316 --> 00:34:58.750 stable epigenetic mark to the epigenetic

NOTE Confidence: 0.853549673076923

00:34:58.750 --> 00:35:00.850 marker of DNA methylation, in particular,

NOTE Confidence: 0.853549673076923

00:35:00.850 --> 00:35:04.846 that is the addition or removal of a methyl

NOTE Confidence: 0.853549673076923

00:35:04.846 --> 00:35:07.674 group to invertebrates, typically cytisine.

NOTE Confidence: 0.853549673076923

00:35:07.674 --> 00:35:09.162 Nucleotides where they're followed

NOTE Confidence: 0.853549673076923

00:35:09.162 --> 00:35:11.070 by Queens in the genome.

NOTE Confidence: 0.853549673076923

00:35:11.070 --> 00:35:13.894 So there are potentially about 20 million or

NOTE Confidence: 0.853549673076923

00:35:13.894 --> 00:35:18.110 so of these CPG sites in in a human genome.

NOTE Confidence: 0.853549673076923

00:35:18.110 --> 00:35:20.182 So this is thought to be a plausible

NOTE Confidence: 0.853549673076923

00:35:20.182 --> 00:35:22.255 mechanism in part because DNA methylation

NOTE Confidence: 0.853549673076923

00:35:22.255 --> 00:35:24.505 is known to be environmentally responsive.

NOTE Confidence: 0.853549673076923

00:35:24.510 --> 00:35:26.708 It's part of the gene regulatory machinery,

NOTE Confidence: 0.853549673076923

00:35:26.710 --> 00:35:28.929 and our genome must be able to

NOTE Confidence: 0.853549673076923

00:35:28.929 --> 00:35:31.011 flexibly respond to its immediate

NOTE Confidence: 0.853549673076923

00:35:31.011 --> 00:35:32.610 environment throughout life.

NOTE Confidence: 0.853549673076923

00:35:32.610 --> 00:35:35.031 In fact, this is happening even as we speak

NOTE Confidence: 0.853549673076923

00:35:35.031 --> 00:35:37.735 as a consequence of what we might have

NOTE Confidence: 0.853549673076923

00:35:37.735 --> 00:35:39.868 eaten before circadian rhythms and so on.

NOTE Confidence: 0.853549673076923

00:35:39.870 --> 00:35:41.705 Depending on where in the

NOTE Confidence: 0.853549673076923

00:35:41.705 --> 00:35:43.173 genome you're talking about.

NOTE Confidence: 0.853549673076923

00:35:43.180 --> 00:35:46.060 Again, DNA methylation has relatively

NOTE Confidence: 0.853549673076923

00:35:46.060 --> 00:35:48.940 remarkable fidelity across cell division,

NOTE Confidence: 0.853549673076923

00:35:48.940 --> 00:35:51.856 and so has the potential to

NOTE Confidence: 0.853549673076923

00:35:51.856 --> 00:35:54.377 remain stable overtime even from

NOTE Confidence: 0.853549673076923

00:35:54.377 --> 00:35:57.257 early life into into later years.

NOTE Confidence: 0.853549673076923

00:35:57.260 --> 00:35:59.381 Evidence that this may in fact be

NOTE Confidence: 0.853549673076923

00:35:59.381 --> 00:36:01.212 a plausible pathway comes from

NOTE Confidence: 0.853549673076923

00:36:01.212 --> 00:36:02.928 correlative studies that link

NOTE Confidence: 0.853549673076923

00:36:02.928 --> 00:36:04.644 early life environmental exposures

NOTE Confidence: 0.853549673076923

00:36:04.709 --> 00:36:06.822 with epigenetic change in humans.

NOTE Confidence: 0.853549673076923

00:36:06.822 --> 00:36:08.100 But of course,

NOTE Confidence: 0.853549673076923

00:36:08.100 --> 00:36:10.030 suffer from the potential confounding

NOTE Confidence: 0.853549673076923

00:36:10.030 --> 00:36:11.960 of early environments that affect

NOTE Confidence: 0.853549673076923

00:36:12.020 --> 00:36:14.030 adult environments that are actually

NOTE Confidence: 0.853549673076923

00:36:14.030 --> 00:36:16.040 immediately responsible for the types

NOTE Confidence: 0.853549673076923

00:36:16.103 --> 00:36:18.287 of epigenetic patterns that have been

NOTE Confidence: 0.853549673076923

00:36:18.287 --> 00:36:21.820 documented in many population studies so far.

NOTE Confidence: 0.853549673076923

00:36:21.820 --> 00:36:22.151 However,

NOTE Confidence: 0.853549673076923

00:36:22.151 --> 00:36:24.137 I think of a potentially bigger

NOTE Confidence: 0.853549673076923

00:36:24.137 --> 00:36:26.384 problem is that although we know

NOTE Confidence: 0.853549673076923

00:36:26.384 --> 00:36:28.364 that DNA methylation can influence

NOTE Confidence: 0.853549673076923

00:36:28.364 --> 00:36:30.198 gene regulation and therefore change

NOTE Confidence: 0.853549673076923

00:36:30.198 --> 00:36:32.473 the Nixon expression in a way that

NOTE Confidence: 0.853549673076923

00:36:32.480 --> 00:36:34.560 it could be phenotypically relevant,

NOTE Confidence: 0.853549673076923

00:36:34.560 --> 00:36:36.700 it doesn't always do so.

NOTE Confidence: 0.853549673076923

00:36:36.700 --> 00:36:39.100 And we know this from experimental studies,

NOTE Confidence: 0.853549673076923

00:36:39.100 --> 00:36:41.896 for example that if used epigenomic

NOTE Confidence: 0.853549673076923

00:36:41.896 --> 00:36:43.760 editing technologies to specifically

NOTE Confidence: 0.853549673076923

00:36:43.826 --> 00:36:46.610 change DNA methylation at individual sites,

NOTE Confidence: 0.853549673076923

00:36:46.610 --> 00:36:50.331 so these are four data from another lab

NOTE Confidence: 0.853549673076923

00:36:50.331 --> 00:36:53.013 that focused on changing DNA methylation,

NOTE Confidence: 0.853549673076923

00:36:53.020 --> 00:36:54.570 and a very specific manner.

NOTE Confidence: 0.853549673076923

00:36:54.570 --> 00:36:58.202 By 4 CPG sites at 1 gene in

NOTE Confidence: 0.853549673076923

00:36:58.202 --> 00:37:00.210 the genome and looked at it.

NOTE Confidence: 0.853549673076923

00:37:00.210 --> 00:37:01.585 Effects on expression and only

NOTE Confidence: 0.853549673076923

00:37:01.585 --> 00:37:03.532 one of these sites is sensitive

NOTE Confidence: 0.853549673076923

00:37:03.532 --> 00:37:04.824 to DNA methylation lawyers.

NOTE Confidence: 0.853549673076923

00:37:04.830 --> 00:37:08.298 The other changes are effectively silent.

NOTE Confidence: 0.853549673076923

00:37:08.300 --> 00:37:10.820 We don't know whether the the cases

NOTE Confidence: 0.853549673076923

00:37:10.820 --> 00:37:13.049 where early environment has even been

NOTE Confidence: 0.853549673076923

00:37:13.049 --> 00:37:14.849 correlated with DNA methylation later

NOTE Confidence: 0.853549673076923

00:37:14.849 --> 00:37:17.289 in life are in that class of silent

NOTE Confidence: 0.853549673076923

00:37:17.290 --> 00:37:20.430 changes or in the class of things that

NOTE Confidence: 0.853549673076923

00:37:20.430 --> 00:37:21.870 might have physiological consequences,

NOTE Confidence: 0.853549673076923

00:37:21.870 --> 00:37:22.926 which are the things that we

NOTE Confidence: 0.853549673076923

00:37:22.926 --> 00:37:23.630 have to care about.

NOTE Confidence: 0.853549673076923

00:37:23.630 --> 00:37:25.100 If we believe this is mediating.

NOTE Confidence: 0.853549673076923

00:37:25.100 --> 00:37:28.537 Early life effects on health and mortality.

NOTE Confidence: 0.853549673076923

00:37:28.540 --> 00:37:30.472 So we have the opportunity to

NOTE Confidence: 0.853549673076923

00:37:30.472 --> 00:37:32.320 study this in Amboseli as well,

NOTE Confidence: 0.853549673076923

00:37:32.320 --> 00:37:34.147 where we can again divorce some of

NOTE Confidence: 0.853549673076923

00:37:34.147 --> 00:37:35.723 these early and adult environmental

NOTE Confidence: 0.853549673076923

00:37:35.723 --> 00:37:37.573 processes and separate out different

NOTE Confidence: 0.853549673076923

00:37:37.573 --> 00:37:39.419 types of early life effects.

NOTE Confidence: 0.853549673076923

00:37:39.420 --> 00:37:40.680 We can do this because,

NOTE Confidence: 0.853549673076923

00:37:40.680 --> 00:37:42.436 although most of the research we

NOTE Confidence: 0.853549673076923

00:37:42.436 --> 00:37:44.800 do on the baboons is non invasive,

NOTE Confidence: 0.853549673076923

00:37:44.800 --> 00:37:46.590 occasionally we have reason to

NOTE Confidence: 0.853549673076923

00:37:46.590 --> 00:37:48.380 want to take biological samples,

NOTE Confidence: 0.853549673076923

00:37:48.380 --> 00:37:50.468 collect morphometric data and so on,

NOTE Confidence: 0.853549673076923

00:37:50.470 --> 00:37:54.394 and so we periodically engage in in

NOTE Confidence: 0.853549673076923

00:37:54.394 --> 00:37:56.518 brief and estimations darting in order

NOTE Confidence: 0.853549673076923

00:37:56.518 --> 00:37:58.688 to collect those sorts of samples.

NOTE Confidence: 0.853549673076923

00:37:58.690 --> 00:38:00.972 So this is our very talented field

NOTE Confidence: 0.853549673076923

00:38:00.972 --> 00:38:02.649 assistant Kenya Larry Terry here.

NOTE Confidence: 0.914546908333333

00:38:02.650 --> 00:38:04.228 You probably can barely see it,

NOTE Confidence: 0.914546908333333

00:38:04.230 --> 00:38:05.958 but he's holding about a metre

NOTE Confidence: 0.914546908333333

00:38:05.958 --> 00:38:08.022 long metal tube in his right arm

NOTE Confidence: 0.914546908333333

00:38:08.022 --> 00:38:09.714 and trying to look as innocuous

NOTE Confidence: 0.914546908333333

00:38:09.714 --> 00:38:11.827 as possible around these baboons.

NOTE Confidence: 0.914546908333333

00:38:11.830 --> 00:38:13.886 We wait for a period in which nobody

NOTE Confidence: 0.914546908333333

00:38:13.886 --> 00:38:15.812 is looking and then very rapidly

NOTE Confidence: 0.914546908333333

00:38:15.812 --> 00:38:17.168 deliver an anesthetic containing

NOTE Confidence: 0.914546908333333

00:38:17.168 --> 00:38:19.402 dart at our animals in order to

NOTE Confidence: 0.914546908333333

00:38:19.402 --> 00:38:20.902 collect these types of samples.

NOTE Confidence: 0.914546908333333

00:38:20.910 --> 00:38:22.387 And over time we've been able to

NOTE Confidence: 0.914546908333333

00:38:22.387 --> 00:38:23.630 collect hundreds of these samples,

NOTE Confidence: 0.914546908333333

00:38:23.630 --> 00:38:25.772 including from individuals where we know

NOTE Confidence: 0.914546908333333

00:38:25.772 --> 00:38:28.500 a lot about both their early life and

NOTE Confidence: 0.914546908333333

00:38:28.500 --> 00:38:31.040 what's going on with them in adulthood.

NOTE Confidence: 0.914546908333333

00:38:31.040 --> 00:38:34.309 We've used a sequencing based method to

NOTE Confidence: 0.914546908333333

00:38:34.309 --> 00:38:36.808 generate genome scale DNA methylation

NOTE Confidence: 0.914546908333333

00:38:36.808 --> 00:38:38.572 data for several 100 individuals,

NOTE Confidence: 0.914546908333333

00:38:38.572 --> 00:38:40.903 including a number of of whom we've

NOTE Confidence: 0.914546908333333

00:38:40.903 --> 00:38:42.499 actually had repeated sampling,

NOTE Confidence: 0.914546908333333

00:38:42.500 --> 00:38:45.338 overtime and post quality filtering are

NOTE Confidence: 0.914546908333333

00:38:45.338 --> 00:38:49.358 able to assess DNA methylation in adulthood.

NOTE Confidence: 0.914546908333333

00:38:49.360 --> 00:38:50.533 In this period,

NOTE Confidence: 0.914546908333333

00:38:50.533 --> 00:38:52.488 in blue for these baboons,

NOTE Confidence: 0.914546908333333

00:38:52.490 --> 00:38:54.975 this is years of life for about

NOTE Confidence: 0.914546908333333

00:38:54.975 --> 00:38:57.657 half a million sites in the genome.

NOTE Confidence: 0.914546908333333

00:38:57.660 --> 00:38:59.535 We asked how individual sources

NOTE Confidence: 0.914546908333333

00:38:59.535 --> 00:39:01.963 of early adversity as well as

NOTE Confidence: 0.914546908333333

00:39:01.963 --> 00:39:03.418 cumulative early adversity,

NOTE Confidence: 0.914546908333333

00:39:03.420 --> 00:39:04.510 that sort of Aces score.

NOTE Confidence: 0.914546908333333

00:39:04.510 --> 00:39:06.595 I talked to you about earlier adding

NOTE Confidence: 0.914546908333333

00:39:06.595 --> 00:39:08.720 up these individual exposures in

NOTE Confidence: 0.914546908333333

00:39:08.720 --> 00:39:12.193 the first few years of life or at

NOTE Confidence: 0.914546908333333

00:39:12.193 --> 00:39:13.893 birth influenced DNA methylation

NOTE Confidence: 0.914546908333333

00:39:13.893 --> 00:39:16.039 collected in this blue period.

NOTE Confidence: 0.914546908333333

00:39:16.040 --> 00:39:17.948 We also paid attention to whether

NOTE Confidence: 0.914546908333333

00:39:17.948 --> 00:39:20.500 animals were born in a relatively high

NOTE Confidence: 0.914546908333333

00:39:20.500 --> 00:39:22.530 habitat quality environment versus a

NOTE Confidence: 0.914546908333333

00:39:22.530 --> 00:39:25.059 relatively low habitat quality environment.

NOTE Confidence: 0.914546908333333

00:39:25.060 --> 00:39:26.922 We had again a sort of natural

NOTE Confidence: 0.914546908333333

00:39:26.922 --> 00:39:28.390 experiment in our population.

NOTE Confidence: 0.914546908333333

00:39:28.390 --> 00:39:30.298 Where our animals made a fairly

NOTE Confidence: 0.914546908333333

00:39:30.298 --> 00:39:32.334 dramatic shift as the quality of

NOTE Confidence: 0.914546908333333

00:39:32.334 --> 00:39:34.074 their initial habitat declined to

NOTE Confidence: 0.914546908333333

00:39:34.074 --> 00:39:36.329 a much higher quality environment

NOTE Confidence: 0.914546908333333

00:39:36.330 --> 00:39:39.960 outside the original area of study.

NOTE Confidence: 0.914546908333333

00:39:39.960 --> 00:39:40.386 Finally,

NOTE Confidence: 0.914546908333333

00:39:40.386 --> 00:39:42.942 we included a measure of their

NOTE Confidence: 0.914546908333333

00:39:42.942 --> 00:39:44.661 adult social circumstance based

NOTE Confidence: 0.914546908333333

00:39:44.661 --> 00:39:46.863 on dominance rank or the position

NOTE Confidence: 0.914546908333333

00:39:46.863 --> 00:39:49.129 in the hierarchy for both females

NOTE Confidence: 0.914546908333333

00:39:49.129 --> 00:39:51.313 and males based on prior evidence

NOTE Confidence: 0.914546908333333

00:39:51.320 --> 00:39:55.928 from my student Jordan's work that.

NOTE Confidence: 0.914546908333333

00:39:55.930 --> 00:39:57.976 That dominance rank is a major

NOTE Confidence: 0.914546908333333

00:39:57.976 --> 00:39:59.807 predictor of differences in gene

NOTE Confidence: 0.914546908333333

00:39:59.807 --> 00:40:01.407 expression in our population.

NOTE Confidence: 0.914546908333333

00:40:01.410 --> 00:40:02.999 So all of this work was really

NOTE Confidence: 0.914546908333333

00:40:02.999 --> 00:40:05.281 led by by Jordan and we're in the

NOTE Confidence: 0.914546908333333

00:40:05.281 --> 00:40:07.050 process of putting it together now

NOTE Confidence: 0.914546908333333

00:40:07.050 --> 00:40:09.108 again to just skip to the results.

NOTE Confidence: 0.914546908333333

00:40:09.110 --> 00:40:11.408 What we find is that early

NOTE Confidence: 0.914546908333333

00:40:11.408 --> 00:40:12.940 life effects do persist.

NOTE Confidence: 0.914546908333333

00:40:12.940 --> 00:40:15.230 Do leave a signature in

NOTE Confidence: 0.914546908333333

00:40:15.230 --> 00:40:16.604 DNA methylation profiles,

NOTE Confidence: 0.914546908333333

00:40:16.610 --> 00:40:18.824 but that this is really most

NOTE Confidence: 0.914546908333333

00:40:18.824 --> 00:40:20.300 apparent for those individuals

NOTE Confidence: 0.914546908333333

00:40:20.372 --> 00:40:22.214 born in that low quality habitat

NOTE Confidence: 0.914546908333333

00:40:22.214 --> 00:40:24.509 and not the high quality habitat.

NOTE Confidence: 0.914546908333333

00:40:24.510 --> 00:40:26.406 So what I'm showing you here.

NOTE Confidence: 0.914546908333333

00:40:26.410 --> 00:40:29.522 On the X axis are the effect sizes

NOTE Confidence: 0.914546908333333

00:40:29.522 --> 00:40:32.627 of cumulative early adversity on DNA

NOTE Confidence: 0.914546908333333

00:40:32.627 --> 00:40:34.867 methylation levels multi measured

NOTE Confidence: 0.914546908333333

00:40:34.867 --> 00:40:37.302 in adulthood for about 470,000.

NOTE Confidence: 0.914546908333333

00:40:37.302 --> 00:40:39.310 Sites in the genome.

NOTE Confidence: 0.914546908333333

00:40:39.310 --> 00:40:41.039 They're quite close to 0 for animals

NOTE Confidence: 0.914546908333333

00:40:41.039 --> 00:40:43.238 born in a resource rich environment,

NOTE Confidence: 0.914546908333333

00:40:43.240 --> 00:40:45.025 but they move quite further

NOTE Confidence: 0.914546908333333

00:40:45.025 --> 00:40:46.810 away from zero on average.

NOTE Confidence: 0.914546908333333

00:40:46.810 --> 00:40:49.180 For those born in low quality

NOTE Confidence: 0.914546908333333

00:40:49.180 --> 00:40:51.715 habitats and we can see a

NOTE Confidence: 0.914546908333333

00:40:51.715 --> 00:40:53.850 very similar type of quality.

NOTE Confidence: 0.914546908333333

00:40:53.850 --> 00:40:56.450 For each of the individual

NOTE Confidence: 0.914546908333333

00:40:56.450 --> 00:40:59.050 sources of building per city.

NOTE Confidence: 0.914546908333333

00:40:59.050 --> 00:41:01.860 Investigated separately.

NOTE Confidence: 0.914546908333333

00:41:01.860 --> 00:41:04.875 So this is what it looks like genome wide.

NOTE Confidence: 0.914546908333333

00:41:04.880 --> 00:41:07.028 These are the effect sizes in

NOTE Confidence: 0.914546908333333

00:41:07.028 --> 00:41:08.460 the high quality environment.

NOTE Confidence: 0.914546908333333

00:41:08.460 --> 00:41:10.140 Individuals born in high quality environment.

NOTE Confidence: 0.914546908333333

00:41:10.140 --> 00:41:11.710 These are effect sizes for

NOTE Confidence: 0.914546908333333

00:41:11.710 --> 00:41:13.280 for individuals born in low

NOTE Confidence: 0.8826710895

00:41:13.340 --> 00:41:14.760 quality environment for exactly

NOTE Confidence: 0.8826710895

00:41:14.760 --> 00:41:16.890 the same sites in the genome.

NOTE Confidence: 0.8826710895

00:41:16.890 --> 00:41:19.837 And again, you can see that replicated

NOTE Confidence: 0.8826710895

00:41:19.837 --> 00:41:21.602 in individual at individual

NOTE Confidence: 0.8826710895

00:41:21.602 --> 00:41:23.446 sites for individual exposures.

NOTE Confidence: 0.8826710895

00:41:23.450 --> 00:41:24.944 Basically, individuals who

NOTE Confidence: 0.8826710895

00:41:24.944 --> 00:41:27.434 are born during a drought.

NOTE Confidence: 0.8826710895

00:41:27.440 --> 00:41:29.096 You can see a market effect of drought

NOTE Confidence: 0.8826710895

00:41:29.096 --> 00:41:30.959 if they were born in that low quality

NOTE Confidence: 0.8826710895

00:41:30.959 --> 00:41:32.928 habitat that's in that sort of pinkish color.

NOTE Confidence: 0.8826710895

00:41:32.930 --> 00:41:34.988 But a much more attenuated effect for

NOTE Confidence: 0.8826710895

00:41:34.988 --> 00:41:37.200 those born in high quality habitats.

NOTE Confidence: 0.8826710895

00:41:37.200 --> 00:41:39.727 So it looks like we're looking at

NOTE Confidence: 0.8826710895

00:41:39.727 --> 00:41:42.099 compounding effects of resource limitation

NOTE Confidence: 0.8826710895

00:41:42.100 --> 00:41:44.896 that the whole population is exposed

NOTE Confidence: 0.8826710895

00:41:44.896 --> 00:41:47.770 to and individual level exposure to.

NOTE Confidence: 0.8826710895

00:41:47.770 --> 00:41:50.029 Early life adversity.

NOTE Confidence: 0.8826710895

00:41:50.030 --> 00:41:51.398 So to give you a sense of the

NOTE Confidence: 0.8826710895

00:41:51.398 --> 00:41:52.388 relative magnitude of these effects,

NOTE Confidence: 0.8826710895

00:41:52.390 --> 00:41:53.862 these are significantly associated

NOTE Confidence: 0.8826710895

00:41:53.862 --> 00:41:56.070 CP G sites in the genome.

NOTE Confidence: 0.8826710895

00:41:56.070 --> 00:41:58.718 Simply, the number of them of those

NOTE Confidence: 0.8826710895

00:41:58.718 --> 00:42:00.670 that we tested based on each of these

NOTE Confidence: 0.8826710895

00:42:00.732 --> 00:42:02.772 predictor variables and the major effects

NOTE Confidence: 0.8826710895

00:42:02.772 --> 00:42:04.990 other than large scale effects of age,

NOTE Confidence: 0.8826710895

00:42:04.990 --> 00:42:07.234 which are expected based on our

NOTE Confidence: 0.8826710895

00:42:07.234 --> 00:42:09.110 and other people's previous work,

NOTE Confidence: 0.8826710895

00:42:09.110 --> 00:42:10.740 are those habitat quality effects.

NOTE Confidence: 0.8826710895

00:42:10.740 --> 00:42:12.510 The difference between being born

NOTE Confidence: 0.8826710895

00:42:12.510 --> 00:42:14.610 in an environment looks like this,

NOTE Confidence: 0.8826710895

00:42:14.610 --> 00:42:17.256 or exactly the same place in the

NOTE Confidence: 0.8826710895

00:42:17.256 --> 00:42:19.939 ecosystem that's been denuded of the major.

NOTE Confidence: 0.8826710895

00:42:19.940 --> 00:42:21.780 Dietary resources for baboons.

NOTE Confidence: 0.8826710895

00:42:21.780 --> 00:42:24.080 The individual sources of early

NOTE Confidence: 0.8826710895

00:42:24.080 --> 00:42:25.890 adversity that matter are are,

NOTE Confidence: 0.8826710895

00:42:25.890 --> 00:42:28.174 particularly those also associated

NOTE Confidence: 0.8826710895

00:42:28.174 --> 00:42:29.887 with resource deprivation.

NOTE Confidence: 0.8826710895

00:42:29.890 --> 00:42:30.215 Drought,

NOTE Confidence: 0.8826710895

00:42:30.215 --> 00:42:32.490 loss of a mother early in life,

NOTE Confidence: 0.8826710895

00:42:32.490 --> 00:42:35.680 and high levels of resource competition.

NOTE Confidence: 0.8826710895

00:42:35.680 --> 00:42:38.760 If the group is is, is dense.

NOTE Confidence: 0.8826710895

00:42:38.760 --> 00:42:40.657 This by itself doesn't answer the question,

NOTE Confidence: 0.8826710895

00:42:40.660 --> 00:42:42.802 though about whether those types of

NOTE Confidence: 0.8826710895

00:42:42.802 --> 00:42:44.750 epigenetic changes are effectively silenced.

NOTE Confidence: 0.8826710895

00:42:44.750 --> 00:42:46.094 Maybe they're simply passive

NOTE Confidence: 0.8826710895

00:42:46.094 --> 00:42:47.774 biomarkers or early life exposure,

NOTE Confidence: 0.8826710895

00:42:47.780 --> 00:42:51.372 or whether they have any potential to mediate

NOTE Confidence: 0.8826710895

00:42:51.372 --> 00:42:53.957 downstream effects on health and survival.

NOTE Confidence: 0.8826710895

00:42:53.960 --> 00:42:55.820 Part of that question can be

NOTE Confidence: 0.8826710895

00:42:55.820 --> 00:42:57.060 answered at least circumstantially,

NOTE Confidence: 0.8826710895

00:42:57.060 --> 00:42:58.698 by asking where in the genome,

NOTE Confidence: 0.8826710895

00:42:58.700 --> 00:43:00.572 differentially expressed early

NOTE Confidence: 0.8826710895

00:43:00.572 --> 00:43:02.444 adversity associated differentially

NOTE Confidence: 0.8826710895

00:43:02.444 --> 00:43:04.940 methylated sorry sites fall.

NOTE Confidence: 0.8826710895

00:43:04.940 --> 00:43:07.264 The genome is a diverse place in

NOTE Confidence: 0.8826710895

00:43:07.264 --> 00:43:09.582 different parts of your DNA sequence

NOTE Confidence: 0.8826710895

00:43:09.582 --> 00:43:12.096 have different roles in gene regulation,

NOTE Confidence: 0.8826710895

00:43:12.100 --> 00:43:14.593 and so a simple question to ask is whether

NOTE Confidence: 0.8826710895

00:43:14.593 --> 00:43:16.183 those differentially methylated sites

NOTE Confidence: 0.8826710895

00:43:16.183 --> 00:43:18.679 tend to fall in regulatory elements

NOTE Confidence: 0.8826710895

00:43:18.679 --> 00:43:20.780 like gene promoters or enhancers.

NOTE Confidence: 0.8826710895

00:43:20.780 --> 00:43:23.167 These elements that tend to loop around

NOTE Confidence: 0.8826710895

00:43:23.167 --> 00:43:24.929 physically interact with the promoters

NOTE Confidence: 0.8826710895

00:43:24.929 --> 00:43:26.969 of genes to modulate gene expression.

NOTE Confidence: 0.8826710895

00:43:26.970 --> 00:43:29.906 Or whether they fall in kind of deserts

NOTE Confidence: 0.8826710895

00:43:29.906 --> 00:43:32.330 of genes or regulatory elements

NOTE Confidence: 0.8826710895

00:43:32.330 --> 00:43:35.292 unannotated regions of the genome and

NOTE Confidence: 0.8826710895

00:43:35.292 --> 00:43:37.548 what we've revealed what we found we think,

NOTE Confidence: 0.8826710895

00:43:37.550 --> 00:43:40.678 is a fairly bimodal pattern,

NOTE Confidence: 0.8826710895

00:43:40.678 --> 00:43:43.282 where if you look at age

NOTE Confidence: 0.8826710895

00:43:43.282 --> 00:43:44.620 differentially expressed sorry,

NOTE Confidence: 0.8826710895

00:43:44.620 --> 00:43:45.898 differentially methylated sites.

NOTE Confidence: 0.8826710895

00:43:45.898 --> 00:43:46.750 For example,

NOTE Confidence: 0.8826710895

00:43:46.750 --> 00:43:48.535 we find that they are enriched in

NOTE Confidence: 0.8826710895

00:43:48.535 --> 00:43:49.913 this pinkish color in Unannotated

NOTE Confidence: 0.8826710895

00:43:49.913 --> 00:43:51.025 region of the unit.

NOTE Confidence: 0.8826710895

00:43:51.030 --> 00:43:51.948 We find a lot of them,

NOTE Confidence: 0.8826710895

00:43:51.950 --> 00:43:53.763 but they don't tend to fall in

NOTE Confidence: 0.8826710895

00:43:53.763 --> 00:43:55.435 places where we believe they're

NOTE Confidence: 0.8826710895

00:43:55.435 --> 00:43:57.525 likely to influence gene regulation.

NOTE Confidence: 0.8826710895

00:43:57.530 --> 00:43:59.595 Habitat quality is fairly neutrally

NOTE Confidence: 0.8826710895

00:43:59.595 --> 00:44:01.247 spread across the genome,

NOTE Confidence: 0.8826710895

00:44:01.250 --> 00:44:03.161 with a little bit of tendency towards

NOTE Confidence: 0.8826710895

00:44:03.161 --> 00:44:04.981 more enrichment in these sort of

NOTE Confidence: 0.8826710895

00:44:04.981 --> 00:44:06.249 functionally important regions of

NOTE Confidence: 0.8826710895

00:44:06.249 --> 00:44:08.030 the genome versus the unannotated,

NOTE Confidence: 0.8826710895

00:44:08.030 --> 00:44:09.490 but it's not very striking,

NOTE Confidence: 0.8826710895

00:44:09.490 --> 00:44:11.555 whereas we if we look at drought

NOTE Confidence: 0.8826710895

00:44:11.555 --> 00:44:13.455 effects or the effects of a social

NOTE Confidence: 0.8826710895

00:44:13.455 --> 00:44:15.105 environment at the time of sampling,

NOTE Confidence: 0.880606502916667

00:44:15.110 --> 00:44:17.371 like male rank, we see a pattern

NOTE Confidence: 0.880606502916667

00:44:17.371 --> 00:44:20.494 that is opposite to that of age where

NOTE Confidence: 0.880606502916667

00:44:20.494 --> 00:44:21.742 those differentially methylated

NOTE Confidence: 0.880606502916667

00:44:21.742 --> 00:44:24.030 sites tend to fall non randomly.

NOTE Confidence: 0.880606502916667

00:44:24.030 --> 00:44:26.170 In enhancers and gene bodies,

NOTE Confidence: 0.880606502916667

00:44:26.170 --> 00:44:27.640 that is, regions of the genome.

NOTE Confidence: 0.880606502916667

00:44:27.640 --> 00:44:29.356 That we believe may be important

NOTE Confidence: 0.880606502916667

00:44:29.356 --> 00:44:31.260 to the Physiology of the Organism,

NOTE Confidence: 0.880606502916667

00:44:31.260 --> 00:44:33.990 and then they tend to be depleted

NOTE Confidence: 0.880606502916667

00:44:33.990 --> 00:44:35.820 in those unannotated regions.

NOTE Confidence: 0.880606502916667

00:44:35.820 --> 00:44:38.250 Another way to look at this is to use

NOTE Confidence: 0.880606502916667

00:44:38.250 --> 00:44:40.498 the chromatin states annotated by the

NOTE Confidence: 0.880606502916667

00:44:40.498 --> 00:44:43.200 road map of the Genomics Consortium.

NOTE Confidence: 0.880606502916667

00:44:43.200 --> 00:44:44.976 This was done for humans that we can

NOTE Confidence: 0.880606502916667

00:44:44.976 --> 00:44:46.817 pull over these annotation to baboons.

NOTE Confidence: 0.880606502916667

00:44:46.820 --> 00:44:48.857 They recognize a number of different sites.

NOTE Confidence: 0.880606502916667

00:44:48.860 --> 00:44:50.792 You can just think about painting

NOTE Confidence: 0.880606502916667

00:44:50.792 --> 00:44:52.427 the genome different colors depending

NOTE Confidence: 0.880606502916667

00:44:52.427 --> 00:44:54.149 on what part of that genome,

NOTE Confidence: 0.880606502916667

00:44:54.150 --> 00:44:55.218 what that part of the genome

NOTE Confidence: 0.880606502916667

00:44:55.218 --> 00:44:56.220 is likely to be doing,

NOTE Confidence: 0.880606502916667

00:44:56.220 --> 00:44:57.780 which is defined in turn by

NOTE Confidence: 0.880606502916667

00:44:57.780 --> 00:44:59.160 different types of histone marks.

NOTE Confidence: 0.880606502916667

00:44:59.160 --> 00:45:02.442 As well as the DNA configuration

NOTE Confidence: 0.880606502916667

00:45:02.442 --> 00:45:03.536 DNA methylation.

NOTE Confidence: 0.880606502916667

00:45:03.540 --> 00:45:05.812 Where the ones on the top of this

NOTE Confidence: 0.880606502916667

00:45:05.812 --> 00:45:08.137 list tend to be linked with active

NOTE Confidence: 0.880606502916667

00:45:08.137 --> 00:45:10.476 regulation and the ones on the bottom

NOTE Confidence: 0.880606502916667

00:45:10.476 --> 00:45:13.070 of the list tend to be associated

NOTE Confidence: 0.880606502916667

00:45:13.070 --> 00:45:14.790 with repression or silencing.

NOTE Confidence: 0.880606502916667

00:45:14.790 --> 00:45:15.540 If we look at age,

NOTE Confidence: 0.880606502916667

00:45:15.540 --> 00:45:18.290 associated State state sites again,

NOTE Confidence: 0.880606502916667

00:45:18.290 --> 00:45:20.996 we see under enrichment or depletion

NOTE Confidence: 0.880606502916667

00:45:20.996 --> 00:45:23.270 in those actively regulated regions

NOTE Confidence: 0.880606502916667

00:45:23.270 --> 00:45:26.078 of the genome and enrichment in in

NOTE Confidence: 0.880606502916667

00:45:26.078 --> 00:45:29.214 repressed or quiescent parts of the genome.

NOTE Confidence: 0.880606502916667

00:45:29.220 --> 00:45:31.662 If we look at socio ecologically

NOTE Confidence: 0.880606502916667

00:45:31.662 --> 00:45:33.704 associated sites, on the other hand,

NOTE Confidence: 0.880606502916667

00:45:33.704 --> 00:45:35.540 here are things like habitat quality,

NOTE Confidence: 0.880606502916667

00:45:35.540 --> 00:45:38.420 drought, or male social status.

NOTE Confidence: 0.880606502916667

00:45:38.420 --> 00:45:40.124 We see the opposite effect on

NOTE Confidence: 0.880606502916667

00:45:40.124 --> 00:45:41.260 this left hand side.

NOTE Confidence: 0.880606502916667

00:45:41.260 --> 00:45:43.150 There's enrichment in regions of the

NOTE Confidence: 0.880606502916667

00:45:43.150 --> 00:45:45.078 genome that are associated with active

NOTE Confidence: 0.880606502916667

00:45:45.078 --> 00:45:46.908 regulation in blood cells as opposed

NOTE Confidence: 0.880606502916667

00:45:46.908 --> 00:45:49.076 to depletion in those age associated sites.

NOTE Confidence: 0.880606502916667

00:45:49.080 --> 00:45:52.306 We see the same kind of pattern as

NOTE Confidence: 0.880606502916667

00:45:52.306 --> 00:45:54.904 age or even more neutral pattern

NOTE Confidence: 0.880606502916667

00:45:54.904 --> 00:45:57.860 for just technical batch effects.

NOTE Confidence: 0.880606502916667

00:45:57.860 --> 00:45:59.799 Now finally I want to say that.

NOTE Confidence: 0.880606502916667

00:45:59.800 --> 00:46:01.556 This is. Still circumstantial.

NOTE Confidence: 0.880606502916667

00:46:01.556 --> 00:46:04.190 What we're saying is that there's

NOTE Confidence: 0.880606502916667

00:46:04.262 --> 00:46:06.217 an association between a which

NOTE Confidence: 0.880606502916667

00:46:06.217 --> 00:46:08.380 is early life exposure and B,

NOTE Confidence: 0.880606502916667

00:46:08.380 --> 00:46:10.300 which is DNA methylation and adulthood,

NOTE Confidence: 0.880606502916667

00:46:10.300 --> 00:46:11.935 and those associations tend to

NOTE Confidence: 0.880606502916667

00:46:11.935 --> 00:46:13.570 fall in particular regions of

NOTE Confidence: 0.880606502916667

00:46:13.627 --> 00:46:15.553 the genome that are probably more

NOTE Confidence: 0.880606502916667

00:46:15.553 --> 00:46:17.500 interesting than just the background.

NOTE Confidence: 0.880606502916667

00:46:17.500 --> 00:46:19.175 They don't provide any direct

NOTE Confidence: 0.880606502916667

00:46:19.175 --> 00:46:20.515 causal evidence is which,

NOTE Confidence: 0.880606502916667

00:46:20.520 --> 00:46:22.360 which is what you really want to have

NOTE Confidence: 0.880606502916667

00:46:22.360 --> 00:46:24.551 if you want to argue for epigenetic

NOTE Confidence: 0.880606502916667

00:46:24.551 --> 00:46:26.226 mediation that an epigenetic change

NOTE Confidence: 0.880606502916667

00:46:26.280 --> 00:46:28.060 directly influences the phenotype,

NOTE Confidence: 0.880606502916667

00:46:28.060 --> 00:46:31.204 or at least gene expression as

NOTE Confidence: 0.880606502916667

00:46:31.204 --> 00:46:32.776 approximate molecular phenotype.

NOTE Confidence: 0.880606502916667

00:46:32.780 --> 00:46:35.740 So we ended up going after this too.

NOTE Confidence: 0.880606502916667

00:46:35.740 --> 00:46:38.288 Inspired by some work done by Alexander

NOTE Confidence: 0.880606502916667

00:46:38.288 --> 00:46:41.158 Stark Lab in Vienna on using massively

NOTE Confidence: 0.880606502916667

00:46:41.158 --> 00:46:43.720 parallel reporter assays to look at

NOTE Confidence: 0.880606502916667

00:46:43.790 --> 00:46:46.352 causal effects of DNA sequence on

NOTE Confidence: 0.880606502916667

00:46:46.352 --> 00:46:48.502 the capacity for regulatory activity.

NOTE Confidence: 0.880606502916667

00:46:48.502 --> 00:46:51.154 There assay is called star seep

NOTE Confidence: 0.880606502916667

00:46:51.154 --> 00:46:53.863 and it basically works by randomly

NOTE Confidence: 0.880606502916667

00:46:53.863 --> 00:46:56.467 shearing or amplifying lots and lots

NOTE Confidence: 0.880606502916667

00:46:56.467 --> 00:46:59.776 of fragments of the genome and cloning

NOTE Confidence: 0.880606502916667

00:46:59.776 --> 00:47:02.270 them into little episomal plasmids like.

NOTE Confidence: 0.880606502916667

00:47:02.270 --> 00:47:04.790 This in a structure so that if the

NOTE Confidence: 0.880606502916667

00:47:04.858 --> 00:47:07.378 piece you cloned in this little olive

NOTE Confidence: 0.880606502916667

00:47:07.378 --> 00:47:09.875 piece actually has the potential to

NOTE Confidence: 0.880606502916667

00:47:09.875 --> 00:47:11.675 drive differential gene regulation

NOTE Confidence: 0.880606502916667

00:47:11.675 --> 00:47:14.026 when you transfect this little circle

NOTE Confidence: 0.880606502916667

00:47:14.026 --> 00:47:16.350 DNA into your cell type of interest,

NOTE Confidence: 0.880606502916667

00:47:16.350 --> 00:47:18.975 then it will cause its own its

NOTE Confidence: 0.880606502916667

00:47:18.975 --> 00:47:20.100 own sequence to

NOTE Confidence: 0.932665579166667

00:47:20.186 --> 00:47:21.815 be transcribed. Basically,

NOTE Confidence: 0.932665579166667

00:47:21.815 --> 00:47:23.840 this green sequence loops around,

NOTE Confidence: 0.932665579166667

00:47:23.840 --> 00:47:25.172 interacts with the promoter,

NOTE Confidence: 0.932665579166667

00:47:25.172 --> 00:47:27.531 and drives its own expression in a

NOTE Confidence: 0.932665579166667

00:47:27.531 --> 00:47:29.666 way that we can track using high

NOTE Confidence: 0.932665579166667

00:47:29.666 --> 00:47:30.940 throughput sequencing technology.

NOTE Confidence: 0.932665579166667

00:47:30.940 --> 00:47:32.870 So regions where you end up with a lot of.

NOTE Confidence: 0.932665579166667

00:47:32.870 --> 00:47:34.970 Seeds when you sequence libraries

NOTE Confidence: 0.932665579166667

00:47:34.970 --> 00:47:37.579 from this type of assay point

NOTE Confidence: 0.932665579166667

00:47:37.579 --> 00:47:40.147 to regions of the genome that

NOTE Confidence: 0.932665579166667

00:47:40.147 --> 00:47:42.170 have active regulatory capacity.

NOTE Confidence: 0.932665579166667

00:47:42.170 --> 00:47:44.546 So we thought, well, this is really cool.

NOTE Confidence: 0.932665579166667

00:47:44.550 --> 00:47:46.503 Can we modify this to look at

NOTE Confidence: 0.932665579166667

00:47:46.503 --> 00:47:48.259 changes in DNA methylation and

NOTE Confidence: 0.932665579166667

00:47:48.259 --> 00:47:50.389 how those changes in isolation?

NOTE Confidence: 0.932665579166667

00:47:50.390 --> 00:47:52.695 Just changing DNA methylation influences

NOTE Confidence: 0.932665579166667

00:47:52.695 --> 00:47:55.830 or fails to influence gene expression.

NOTE Confidence: 0.932665579166667

00:47:55.830 --> 00:47:59.401 So we ended up tweaking the assay

NOTE Confidence: 0.932665579166667

00:47:59.401 --> 00:48:02.263 and and producing a separate plasmid

NOTE Confidence: 0.932665579166667

00:48:02.263 --> 00:48:05.365 PM star seek one which you can

NOTE Confidence: 0.932665579166667

00:48:05.365 --> 00:48:07.570 actually order yourself from addgene

NOTE Confidence: 0.932665579166667

00:48:07.570 --> 00:48:09.795 if you're interested and producing

NOTE Confidence: 0.932665579166667

00:48:09.795 --> 00:48:12.343 the same kind of assay idea, but.

NOTE Confidence: 0.932665579166667

00:48:12.343 --> 00:48:14.821 But leaving sites targets of DNA

NOTE Confidence: 0.932665579166667

00:48:14.821 --> 00:48:16.701 methylation vertebrates only in those

NOTE Confidence: 0.932665579166667

00:48:16.701 --> 00:48:19.005 regions that we clone in in olive and

NOTE Confidence: 0.932665579166667

00:48:19.068 --> 00:48:21.320 either experimentally methylating them

NOTE Confidence: 0.932665579166667

00:48:21.320 --> 00:48:24.135 or leaving them experimentally methylated.

NOTE Confidence: 0.932665579166667

00:48:24.140 --> 00:48:25.876 That means we can compare the regulatory

NOTE Confidence: 0.932665579166667

00:48:25.876 --> 00:48:27.560 activity of the exact same sequence,

NOTE Confidence: 0.932665579166667

00:48:27.560 --> 00:48:29.423 and we can do this for hundreds of thousands

NOTE Confidence: 0.932665579166667

00:48:29.423 --> 00:48:31.088 of fragments in the genome at once,

NOTE Confidence: 0.932665579166667

00:48:31.090 --> 00:48:32.950 where the only difference between two

NOTE Confidence: 0.932665579166667

00:48:32.950 --> 00:48:35.188 fragments of the same location is whether

NOTE Confidence: 0.932665579166667

00:48:35.188 --> 00:48:37.078 those sites are methylated or not,

NOTE Confidence: 0.932665579166667

00:48:37.080 --> 00:48:38.862 and the results of that assay

NOTE Confidence: 0.932665579166667

00:48:38.862 --> 00:48:41.201 for like 1 region of the genome

NOTE Confidence: 0.932665579166667

00:48:41.201 --> 00:48:42.645 looks something like this.

NOTE Confidence: 0.932665579166667

00:48:42.650 --> 00:48:45.770 This happens to be data from the human

NOTE Confidence: 0.932665579166667

00:48:45.770 --> 00:48:48.664 genome in and around the gene NF Kappa BIA,

NOTE Confidence: 0.932665579166667

00:48:48.670 --> 00:48:51.154 where if you see higher levels

NOTE Confidence: 0.932665579166667

00:48:51.154 --> 00:48:53.910 of RNA produced at that region,

NOTE Confidence: 0.932665579166667

00:48:53.910 --> 00:48:55.938 higher levels of expression

NOTE Confidence: 0.932665579166667

00:48:55.938 --> 00:48:58.473 relative to the input DNA.

NOTE Confidence: 0.932665579166667

00:48:58.480 --> 00:49:01.036 Then that points to regulatory activity,

NOTE Confidence: 0.932665579166667

00:49:01.040 --> 00:49:02.816 and in this case that happens

NOTE Confidence: 0.932665579166667

00:49:02.816 --> 00:49:04.000 in the methylated condition.

NOTE Confidence: 0.932665579166667

00:49:04.000 --> 00:49:05.600 This is an active enhancer,

NOTE Confidence: 0.932665579166667

00:49:05.600 --> 00:49:07.436 but not when the exact same

NOTE Confidence: 0.932665579166667

00:49:07.436 --> 00:49:08.354 sequence is methylated,

NOTE Confidence: 0.932665579166667

00:49:08.360 --> 00:49:10.285 so this was work that was pioneered.

NOTE Confidence: 0.932665579166667

00:49:10.290 --> 00:49:12.768 This protocol was led by Amanda Lea,

NOTE Confidence: 0.932665579166667

00:49:12.770 --> 00:49:13.740 the same person who took,

NOTE Confidence: 0.932665579166667

00:49:13.740 --> 00:49:16.320 but I'm predictive adaptive response stuff,

NOTE Confidence: 0.932665579166667

00:49:16.320 --> 00:49:18.860 and we generated data for

NOTE Confidence: 0.932665579166667

00:49:18.860 --> 00:49:20.936 bedroom specifically in work led

NOTE Confidence: 0.932665579166667

00:49:20.936 --> 00:49:22.696 by my postdoc Dana Lynn.

NOTE Confidence: 0.932665579166667

00:49:22.700 --> 00:49:24.434 So basically we cross referenced that

NOTE Confidence: 0.932665579166667

00:49:24.434 --> 00:49:26.909 with all the regions in the genome that

NOTE Confidence: 0.932665579166667

00:49:26.909 --> 00:49:28.489 we know are differentially methylated.

NOTE Confidence: 0.932665579166667

00:49:28.490 --> 00:49:30.470 An association with early life drought,

NOTE Confidence: 0.932665579166667

00:49:30.470 --> 00:49:31.238 for example,

NOTE Confidence: 0.932665579166667

00:49:31.238 --> 00:49:32.390 or with aging,

NOTE Confidence: 0.932665579166667

00:49:32.390 --> 00:49:34.868 and what we find is the following

NOTE Confidence: 0.932665579166667

00:49:34.868 --> 00:49:36.362 of about 200,000 windows.

NOTE Confidence: 0.932665579166667

00:49:36.362 --> 00:49:37.926 We tested genome wide.

NOTE Confidence: 0.932665579166667

00:49:37.930 --> 00:49:40.700 I just want to point out that really only a

NOTE Confidence: 0.932665579166667

00:49:40.773 --> 00:49:43.765 minority of them in a particular cell type

NOTE Confidence: 0.932665579166667

00:49:43.765 --> 00:49:46.068 have regulatory capacity to begin with,

NOTE Confidence: 0.932665579166667

00:49:46.070 --> 00:49:46.275 right?

NOTE Confidence: 0.932665579166667

00:49:46.275 --> 00:49:48.530 Most of CP G sites and most of the genome,

NOTE Confidence: 0.932665579166667

00:49:48.530 --> 00:49:49.850 whether they're methylated or not,

NOTE Confidence: 0.932665579166667

00:49:49.850 --> 00:49:52.020 don't do much of anything,

NOTE Confidence: 0.932665579166667

00:49:52.020 --> 00:49:54.564 but if they are drought associated

NOTE Confidence: 0.932665579166667

00:49:54.564 --> 00:49:57.649 sites or male ranked associated sites,

NOTE Confidence: 0.932665579166667

00:49:57.650 --> 00:49:58.346 they're significantly.

NOTE Confidence: 0.932665579166667

00:49:58.346 --> 00:50:01.130 More likely to fall in one of those

NOTE Confidence: 0.932665579166667

00:50:01.195 --> 00:50:02.955 active regulatory regions than

NOTE Confidence: 0.932665579166667

00:50:02.955 --> 00:50:05.155 expected just by background chance,

NOTE Confidence: 0.932665579166667

00:50:05.160 --> 00:50:06.840 where again if we use age,

NOTE Confidence: 0.932665579166667

00:50:06.840 --> 00:50:08.496 differentially methylated sites as a control,

NOTE Confidence: 0.932665579166667

00:50:08.500 --> 00:50:11.804 you see no such signal of active

NOTE Confidence: 0.932665579166667

00:50:11.804 --> 00:50:13.220 participation in regulation.

NOTE Confidence: 0.932665579166667

00:50:13.220 --> 00:50:15.436 And so now we were able to start

NOTE Confidence: 0.932665579166667

00:50:15.436 --> 00:50:16.996 putting together our results like

NOTE Confidence: 0.932665579166667

00:50:16.996 --> 00:50:18.892 this where for a very particular

NOTE Confidence: 0.932665579166667

00:50:18.892 --> 00:50:20.767 region of the genome that contains

NOTE Confidence: 0.932665579166667

00:50:20.767 --> 00:50:22.262 specific set of CPG sites

NOTE Confidence: 0.871907835

00:50:22.270 --> 00:50:24.850 we see. Increases.

NOTE Confidence: 0.871907835

00:50:24.850 --> 00:50:27.700 In RNA relative to DNA,

NOTE Confidence: 0.871907835

00:50:27.700 --> 00:50:29.674 if that region fragment is not methylated,

NOTE Confidence: 0.871907835

00:50:29.680 --> 00:50:32.260 so zero methylation means that you

NOTE Confidence: 0.871907835

00:50:32.260 --> 00:50:34.480 see regulatory activity he there,

NOTE Confidence: 0.871907835

00:50:34.480 --> 00:50:36.862 whereas if that exact same sequence

NOTE Confidence: 0.871907835

00:50:36.862 --> 00:50:39.615 is methylated then we see complete

NOTE Confidence: 0.871907835

00:50:39.615 --> 00:50:41.799 repression of regulatory activity,

NOTE Confidence: 0.871907835

00:50:41.800 --> 00:50:44.089 so pointing this is a way of

NOTE Confidence: 0.871907835

00:50:44.089 --> 00:50:45.070 identifying methylation dependent

NOTE Confidence: 0.871907835

00:50:45.131 --> 00:50:47.136 regulatory activity across the genome.

NOTE Confidence: 0.871907835

00:50:47.140 --> 00:50:48.710 This particular example gives us

NOTE Confidence: 0.871907835

00:50:48.710 --> 00:50:50.659 causal evidence in an in vitro

NOTE Confidence: 0.871907835

00:50:50.659 --> 00:50:52.279 framework that those sites have

NOTE Confidence: 0.871907835

00:50:52.279 --> 00:50:54.019 the capacity to drive differential

NOTE Confidence: 0.871907835

00:50:54.019 --> 00:50:55.919 expression and the particular sites

NOTE Confidence: 0.871907835

00:50:55.919 --> 00:50:58.622 I'm showing you here happen to be.

NOTE Confidence: 0.871907835

00:50:58.622 --> 00:50:59.410 Forked sites.

NOTE Confidence: 0.871907835

00:50:59.410 --> 00:51:00.132 That's it.

NOTE Confidence: 0.871907835

00:51:00.132 --> 00:51:02.298 Just upstream of a gene that's

NOTE Confidence: 0.871907835

00:51:02.298 --> 00:51:05.290 important to T cell receptor activation.

NOTE Confidence: 0.871907835

00:51:05.290 --> 00:51:07.466 We can then couple that with the observation.

NOTE Confidence: 0.871907835

00:51:07.470 --> 00:51:09.150 ULL data from the animals themselves

NOTE Confidence: 0.871907835

00:51:09.150 --> 00:51:11.237 in vivo in a completely unmanipulated

NOTE Confidence: 0.871907835

00:51:11.237 --> 00:51:13.487 environment where we see that,

NOTE Confidence: 0.871907835

00:51:13.490 --> 00:51:14.442 for example,

NOTE Confidence: 0.871907835

00:51:14.442 --> 00:51:17.298 male social status is also associated

NOTE Confidence: 0.871907835

00:51:17.298 --> 00:51:19.788 with levels of DNA methylation,

NOTE Confidence: 0.871907835

00:51:19.790 --> 00:51:21.618 and independently with levels

NOTE Confidence: 0.871907835

00:51:21.618 --> 00:51:22.989 of gene expression.

NOTE Confidence: 0.871907835

00:51:22.990 --> 00:51:24.680 So the correlation is consistent

NOTE Confidence: 0.871907835

00:51:24.680 --> 00:51:27.170 with the causal of the correlation.

NOTE Confidence: 0.871907835

00:51:27.170 --> 00:51:29.790 Evidence in vivo is consistent

NOTE Confidence: 0.871907835

00:51:29.790 --> 00:51:33.050 with the causal evidence in vitro.

NOTE Confidence: 0.871907835

00:51:33.050 --> 00:51:34.378 So to sum up,

NOTE Confidence: 0.871907835

00:51:34.378 --> 00:51:36.038 we have this hypothesis about

NOTE Confidence: 0.871907835

00:51:36.038 --> 00:51:38.520 this pathway that connects early

NOTE Confidence: 0.871907835

00:51:38.520 --> 00:51:40.596 environment to adult phenotypes.

NOTE Confidence: 0.871907835

00:51:40.600 --> 00:51:42.410 Our data suggests that early

NOTE Confidence: 0.871907835

00:51:42.410 --> 00:51:43.858 environments also predict DNA

NOTE Confidence: 0.871907835

00:51:43.858 --> 00:51:44.949 methylation in adulthood.

NOTE Confidence: 0.871907835

00:51:44.950 --> 00:51:46.450 In this natural environment,

NOTE Confidence: 0.871907835

00:51:46.450 --> 00:51:47.950 where there's absolutely no

NOTE Confidence: 0.871907835

00:51:47.950 --> 00:51:49.472 correlation between drought in the

NOTE Confidence: 0.871907835

00:51:49.472 --> 00:51:50.918 first year of life and rainfall

NOTE Confidence: 0.871907835

00:51:50.918 --> 00:51:52.400 at the time of measurement,

NOTE Confidence: 0.871907835

00:51:52.400 --> 00:51:55.053 but that those types of patterns are

NOTE Confidence: 0.871907835

00:51:55.053 --> 00:51:57.569 compounded by further resource limitation.

NOTE Confidence: 0.871907835

00:51:57.570 --> 00:51:58.326 In other words,

NOTE Confidence: 0.871907835

00:51:58.326 --> 00:51:59.586 we're really only seeing this

NOTE Confidence: 0.871907835

00:51:59.586 --> 00:52:01.126 when the animals are exposed

NOTE Confidence: 0.871907835

00:52:01.126 --> 00:52:02.434 to fairly severe deprivation.

NOTE Confidence: 0.871907835

00:52:02.440 --> 00:52:05.659 Material deprivation linked to both

NOTE Confidence: 0.871907835

00:52:05.659 --> 00:52:07.570 a low quality environment as a whole

NOTE Confidence: 0.871907835

00:52:07.623 --> 00:52:09.261 and then further knock on effects

NOTE Confidence: 0.871907835

00:52:09.261 --> 00:52:11.530 of other types of individual adversity.

NOTE Confidence: 0.871907835

00:52:11.530 --> 00:52:13.195 And that leads to substantial

NOTE Confidence: 0.871907835

00:52:13.195 --> 00:52:14.194 heterogeneity across different

NOTE Confidence: 0.871907835

00:52:14.194 --> 00:52:15.970 forms of early life experience.

NOTE Confidence: 0.871907835

00:52:15.970 --> 00:52:16.450 Where,

NOTE Confidence: 0.871907835

00:52:16.450 --> 00:52:17.410 grossly speaking,

NOTE Confidence: 0.871907835

00:52:17.410 --> 00:52:20.770 I would say our data are consistent

NOTE Confidence: 0.871907835

00:52:20.850 --> 00:52:22.950 with effects of deprivation

NOTE Confidence: 0.871907835

00:52:22.950 --> 00:52:25.196 related early life experiences

NOTE Confidence: 0.871907835

00:52:25.196 --> 00:52:28.526 rather than social threat related.

NOTE Confidence: 0.871907835

00:52:28.530 --> 00:52:30.570 Early life experience like being

NOTE Confidence: 0.871907835

00:52:30.570 --> 00:52:33.230 born to a low status mother.

NOTE Confidence: 0.871907835

00:52:33.230 --> 00:52:33.711 Additionally,

NOTE Confidence: 0.871907835

00:52:33.711 --> 00:52:36.116 our data suggests that DNA

NOTE Confidence: 0.871907835

00:52:36.116 --> 00:52:38.040 methylation associated with the

NOTE Confidence: 0.871907835

00:52:38.108 --> 00:52:39.924 social or ecological environment

NOTE Confidence: 0.871907835

00:52:39.924 --> 00:52:42.648 and including sources of early life

NOTE Confidence: 0.871907835

00:52:42.719 --> 00:52:45.485 adversity are more likely to be

NOTE Confidence: 0.871907835

00:52:45.485 --> 00:52:47.329 functionally relevant than background

NOTE Confidence: 0.871907835

00:52:47.330 --> 00:52:48.840 sites identified in the genome,

NOTE Confidence: 0.871907835

00:52:48.840 --> 00:52:50.340 including those that we can detect

NOTE Confidence: 0.871907835

00:52:50.340 --> 00:52:52.193 in the exact same data set in

NOTE Confidence: 0.871907835

00:52:52.193 --> 00:52:54.022 association with age, for example.

NOTE Confidence: 0.871907835

00:52:54.022 --> 00:52:55.922 So that's promising, right?

NOTE Confidence: 0.871907835

00:52:55.922 --> 00:52:56.274 It?

NOTE Confidence: 0.871907835

00:52:56.274 --> 00:52:58.738 It speaks to the potential for this

NOTE Confidence: 0.871907835

00:52:58.738 --> 00:53:00.729 mediating pathway to really matter,

NOTE Confidence: 0.871907835

00:53:00.730 --> 00:53:02.550 but I think that our results also

NOTE Confidence: 0.871907835

00:53:02.550 --> 00:53:04.350 suggest that care is still warranted.

NOTE Confidence: 0.871907835

00:53:04.350 --> 00:53:06.050 Warranted we see this enrichment,

NOTE Confidence: 0.871907835

00:53:06.050 --> 00:53:07.850 but there's lots of individual sites

NOTE Confidence: 0.871907835

00:53:07.850 --> 00:53:09.969 that are early life associated that,

NOTE Confidence: 0.871907835

00:53:09.970 --> 00:53:11.867 as far as we can tell from

NOTE Confidence: 0.871907835

00:53:11.867 --> 00:53:13.110 the data available to us,

NOTE Confidence: 0.871907835

00:53:13.110 --> 00:53:14.618 don't particularly do anything,

NOTE Confidence: 0.871907835

00:53:14.618 --> 00:53:17.470 and if they don't particularly do anything,

NOTE Confidence: 0.871907835

00:53:17.470 --> 00:53:19.690 then they are very unlikely to

NOTE Confidence: 0.871907835

00:53:19.690 --> 00:53:22.452 rely on a causal pathway between

NOTE Confidence: 0.871907835

00:53:22.452 --> 00:53:24.692 early life environment and,

NOTE Confidence: 0.871907835

00:53:24.692 --> 00:53:25.576 for example,

NOTE Confidence: 0.871907835

00:53:25.576 --> 00:53:27.344 compromised health or earlier

NOTE Confidence: 0.871907835

00:53:27.344 --> 00:53:28.670 mortality in adulthood.

NOTE Confidence: 0.871907835

00:53:28.670 --> 00:53:30.734 And I think that the lesson for us

NOTE Confidence: 0.871907835

00:53:30.734 --> 00:53:32.628 is that those correlations that

NOTE Confidence: 0.871907835

00:53:32.628 --> 00:53:34.818 we observe in population studies.

NOTE Confidence: 0.871907835

00:53:34.820 --> 00:53:37.046 So far are really the first step

NOTE Confidence: 0.871907835

00:53:37.046 --> 00:53:38.000 and the second

NOTE Confidence: 0.877331316470588

00:53:38.076 --> 00:53:40.206 step that we should increasingly

NOTE Confidence: 0.877331316470588

00:53:40.206 --> 00:53:43.012 think about embedding into studies of

NOTE Confidence: 0.877331316470588

00:53:43.012 --> 00:53:44.964 environmental or social epigenetics

NOTE Confidence: 0.877331316470588

00:53:44.964 --> 00:53:47.168 in general are causal tests,

NOTE Confidence: 0.877331316470588

00:53:47.170 --> 00:53:49.840 especially experimental tests where possible

NOTE Confidence: 0.877331316470588

00:53:49.840 --> 00:53:53.060 of whether those differences even matter.

NOTE Confidence: 0.877331316470588

00:53:53.060 --> 00:53:56.219 So in some we see effects of early life

NOTE Confidence: 0.877331316470588

00:53:56.219 --> 00:53:58.564 environment on later life phenotype that

NOTE Confidence: 0.877331316470588

00:53:58.564 --> 00:54:00.994 are in many ways strikingly parallel

NOTE Confidence: 0.877331316470588

00:54:00.994 --> 00:54:03.586 to what's been described in humans.

NOTE Confidence: 0.877331316470588

00:54:03.590 --> 00:54:04.948 And in fact some of the measurement

NOTE Confidence: 0.877331316470588

00:54:04.948 --> 00:54:05.939 constructs that we've been using.

NOTE Confidence: 0.877331316470588

00:54:05.940 --> 00:54:07.805 The baboons are directly borrowed

NOTE Confidence: 0.877331316470588

00:54:07.805 --> 00:54:09.670 from the literature in humans.

NOTE Confidence: 0.877331316470588

00:54:09.670 --> 00:54:12.664 These suggest that early life effects

NOTE Confidence: 0.877331316470588

00:54:12.664 --> 00:54:16.379 on later life health are not something

NOTE Confidence: 0.877331316470588

00:54:16.379 --> 00:54:19.631 that humans invented and not purely

NOTE Confidence: 0.877331316470588

00:54:19.631 --> 00:54:22.486 explained by the types of highly developed.

NOTE Confidence: 0.877331316470588

00:54:22.486 --> 00:54:24.338 Urban environments that many

NOTE Confidence: 0.877331316470588

00:54:24.338 --> 00:54:26.740 of us live in today.

NOTE Confidence: 0.877331316470588

00:54:26.740 --> 00:54:30.674 Rather, they're part of the fabric of

NOTE Confidence: 0.877331316470588

00:54:30.680 --> 00:54:33.480 the societies of primates and other long

NOTE Confidence: 0.877331316470588

00:54:33.480 --> 00:54:35.976 lived social mammals that have probably

NOTE Confidence: 0.877331316470588

00:54:35.976 --> 00:54:38.825 predated our species for millions of years.

NOTE Confidence: 0.877331316470588

00:54:38.830 --> 00:54:40.162 However, because these species,

NOTE Confidence: 0.877331316470588

00:54:40.162 --> 00:54:42.730 like the baboons live in a relatively

NOTE Confidence: 0.877331316470588

00:54:42.730 --> 00:54:45.270 simplified environment compared to humans,

NOTE Confidence: 0.877331316470588

00:54:45.270 --> 00:54:46.805 studying them gives an ability

NOTE Confidence: 0.877331316470588

00:54:46.805 --> 00:54:48.776 to ask questions about the types

NOTE Confidence: 0.877331316470588

00:54:48.776 --> 00:54:49.907 of early environments,

NOTE Confidence: 0.877331316470588

00:54:49.910 --> 00:54:51.920 the way they split between

NOTE Confidence: 0.877331316470588

00:54:51.920 --> 00:54:53.464 different types of exposure.

NOTE Confidence: 0.877331316470588

00:54:53.464 --> 00:54:55.394 And the relationship between early

NOTE Confidence: 0.877331316470588

00:54:55.394 --> 00:54:57.519 life and adulthood that are sometimes

NOTE Confidence: 0.877331316470588

00:54:57.519 --> 00:55:00.109 difficult to come to grips with in humans.

NOTE Confidence: 0.877331316470588

00:55:00.110 --> 00:55:04.060 And so with that I just want to thank the

NOTE Confidence: 0.877331316470588

00:55:04.157 --> 00:55:06.828 people who have led a lot of this work.

NOTE Confidence: 0.877331316470588

00:55:06.830 --> 00:55:07.634 Susan, Albert Smith,

NOTE Confidence: 0.877331316470588

00:55:07.634 --> 00:55:08.706 Archie and Jean Altman,

NOTE Confidence: 0.877331316470588

00:55:08.710 --> 00:55:10.910 who are my fellow travelers on all of

NOTE Confidence: 0.877331316470588

00:55:10.910 --> 00:55:13.067 the research that has to do with baboons.

NOTE Confidence: 0.877331316470588

00:55:13.070 --> 00:55:14.780 Matthew Schippel, Susan,

NOTE Confidence: 0.877331316470588

00:55:14.780 --> 00:55:17.630 former student who led the

NOTE Confidence: 0.877331316470588

00:55:17.630 --> 00:55:19.210 intergenerational adversity work.

NOTE Confidence: 0.877331316470588

00:55:19.210 --> 00:55:20.341 My own lab,

NOTE Confidence: 0.877331316470588

00:55:20.341 --> 00:55:21.849 and particularly Amanda Lea,

NOTE Confidence: 0.877331316470588

00:55:21.850 --> 00:55:23.510 Jordan Anderson and Dana Lynn,

NOTE Confidence: 0.877331316470588

00:55:23.510 --> 00:55:25.606 who were the trainees who produced some of

NOTE Confidence: 0.877331316470588

00:55:25.606 --> 00:55:27.884 the work that I talked to you about today.

NOTE Confidence: 0.877331316470588

00:55:27.890 --> 00:55:29.878 And if there's time I'd be happy

NOTE Confidence: 0.877331316470588

00:55:29.878 --> 00:55:31.440 to take any questions.

NOTE Confidence: 0.901443506296296

00:55:33.640 --> 00:55:35.901 Fantastic thank you so much Jenny and

NOTE Confidence: 0.901443506296296

00:55:35.901 --> 00:55:38.726 and you do indeed have we do indeed

NOTE Confidence: 0.901443506296296

00:55:38.726 --> 00:55:41.521 have some time for questions despite me

NOTE Confidence: 0.901443506296296

00:55:41.521 --> 00:55:43.876 interrupting you mid mid presentation.

NOTE Confidence: 0.901443506296296

00:55:43.880 --> 00:55:46.496 You know just what. So first of all,

NOTE Confidence: 0.901443506296296

00:55:46.500 --> 00:55:48.138 ask anyone that wants to raise

NOTE Confidence: 0.901443506296296

00:55:48.138 --> 00:55:49.975 their hand and they can mute

NOTE Confidence: 0.901443506296296

00:55:49.975 --> 00:55:51.355 themselves and ask questions.

NOTE Confidence: 0.901443506296296

00:55:51.360 --> 00:55:53.901 Or feel free to put your question

NOTE Confidence: 0.901443506296296

00:55:53.901 --> 00:55:55.850 into the chat for Jenny.

NOTE Confidence: 0.930652434

00:55:58.550 --> 00:56:00.340 Hi I have a question. My name

NOTE Confidence: 0.517075307666667

00:56:00.350 --> 00:56:03.636 is Tara Vaccarino. Are the trust

NOTE Confidence: 0.517075307666667

00:56:03.636 --> 00:56:05.708 a decent? Are wonderful seminar

NOTE Confidence: 0.951936377142857

00:56:06.180 --> 00:56:09.568 I can you hear me I wanted yeah I

NOTE Confidence: 0.951936377142857

00:56:09.568 --> 00:56:13.080 wanted to ask you to what extent

NOTE Confidence: 0.951936377142857

00:56:13.080 --> 00:56:15.868 this you think that this early effect

NOTE Confidence: 0.845759544

00:56:15.880 --> 00:56:17.415 of the environment are actually

NOTE Confidence: 0.845759544

00:56:17.415 --> 00:56:18.950 acting on the prenatal stage

NOTE Confidence: 0.88519188

00:56:18.960 --> 00:56:20.240 rather than early postnatal?

NOTE Confidence: 0.88519188

00:56:20.240 --> 00:56:22.705 I think in principle there is no

NOTE Confidence: 0.88519188

00:56:22.705 --> 00:56:25.406 proof that drastic conditions like

NOTE Confidence: 0.88519188

00:56:25.406 --> 00:56:27.770 what you're studying like drought

NOTE Confidence: 0.868411351428572

00:56:27.780 --> 00:56:30.250 for example, or even dominance

NOTE Confidence: 0.868411351428572

00:56:30.250 --> 00:56:31.673 amongst these primates

NOTE Confidence: 0.868411351428572

00:56:31.673 --> 00:56:33.370 could actually not affect.

NOTE Confidence: 0.868411351428572

00:56:33.370 --> 00:56:36.329 Much earlier phases of development,

NOTE Confidence: 0.868411351428572

00:56:36.329 --> 00:56:37.748 including the brain,

NOTE Confidence: 0.868411351428572

00:56:37.750 --> 00:56:39.290 not just the blood,

NOTE Confidence: 0.868411351428572

00:56:39.290 --> 00:56:42.328 which is what you can study postnatally.

NOTE Confidence: 0.868411351428572

00:56:42.330 --> 00:56:44.079 So what would

NOTE Confidence: 0.771023164285714

00:56:44.090 --> 00:56:47.128 be a potential Ave to study earlier

NOTE Confidence: 0.771023164285714

00:56:47.130 --> 00:56:49.578 effect and to what extent do you think

NOTE Confidence: 0.771023164285714

00:56:49.580 --> 00:56:52.168 they're possible or even likely? Thank

NOTE Confidence: 0.913404643333333

00:56:52.180 --> 00:56:55.936 you. I think they're entirely possible,

NOTE Confidence: 0.913404643333333

00:56:55.940 --> 00:56:57.620 and it sort of depends on our

NOTE Confidence: 0.913404643333333

00:56:57.620 --> 00:56:59.330 ability to get at that question.

NOTE Confidence: 0.913404643333333

00:56:59.330 --> 00:57:01.240 Depends on the source of

NOTE Confidence: 0.913404643333333

00:57:01.240 --> 00:57:02.768 early adversity in question,

NOTE Confidence: 0.913404643333333

00:57:02.770 --> 00:57:05.731 so for some of the things we're

NOTE Confidence: 0.913404643333333

00:57:05.731 --> 00:57:07.480 considering like early life.

NOTE Confidence: 0.834735614444444

00:57:09.810 --> 00:57:12.030 Social status, maternal social status

NOTE Confidence: 0.834735614444444

00:57:12.030 --> 00:57:13.806 or maternal social integration.

NOTE Confidence: 0.834735614444444

00:57:13.810 --> 00:57:16.490 Those don't change a whole lot in our

NOTE Confidence: 0.834735614444444

00:57:16.490 --> 00:57:18.478 study system prenatally to postnatally

NOTE Confidence: 0.834735614444444

00:57:18.478 --> 00:57:20.980 within a short period of time,

NOTE Confidence: 0.834735614444444

00:57:20.980 --> 00:57:24.072 and so we really can't disentangle

NOTE Confidence: 0.834735614444444

00:57:24.072 --> 00:57:26.832 whether the crucial point there

NOTE Confidence: 0.834735614444444

00:57:26.832 --> 00:57:30.469 is in utero or or post Natal.

NOTE Confidence: 0.834735614444444

00:57:30.470 --> 00:57:32.606 We can do a little bit actually with

NOTE Confidence: 0.834735614444444

00:57:32.606 --> 00:57:34.556 the drought effects because we have

NOTE Confidence: 0.834735614444444

00:57:34.556 --> 00:57:36.251 such seasonality in our population

NOTE Confidence: 0.834735614444444

00:57:36.251 --> 00:57:38.378 in year to year variation differs.

NOTE Confidence: 0.834735614444444

00:57:38.380 --> 00:57:40.438 So for example, when we were looking

NOTE Confidence: 0.834735614444444

00:57:40.438 --> 00:57:42.069 at drought effects on fertility,

NOTE Confidence: 0.834735614444444

00:57:42.070 --> 00:57:43.750 we used the first year of life,

NOTE Confidence: 0.834735614444444

00:57:43.750 --> 00:57:46.306 but we also did some comparisons

NOTE Confidence: 0.834735614444444

00:57:46.306 --> 00:57:48.010 with the prenatal period.

NOTE Confidence: 0.834735614444444

00:57:48.010 --> 00:57:50.314 So if you just take birth

NOTE Confidence: 0.834735614444444

00:57:50.314 --> 00:57:51.850 minus a year instead,

NOTE Confidence: 0.834735614444444

00:57:51.850 --> 00:57:53.660 which would cover conception as

NOTE Confidence: 0.834735614444444

00:57:53.660 --> 00:57:56.024 well in these animals and we

NOTE Confidence: 0.834735614444444

00:57:56.024 --> 00:57:58.309 get similar kinds of patterns,

NOTE Confidence: 0.834735614444444

00:57:58.310 --> 00:58:00.354 but they're weaker, which.

NOTE Confidence: 0.834735614444444

00:58:00.354 --> 00:58:01.376 You know,

NOTE Confidence: 0.834735614444444

00:58:01.380 --> 00:58:02.295 obviously I think you would

NOTE Confidence: 0.834735614444444

00:58:02.295 --> 00:58:03.539 take that with a grain of salt,

NOTE Confidence: 0.834735614444444

00:58:03.540 --> 00:58:05.430 but they would suggest to us by

NOTE Confidence: 0.834735614444444

00:58:05.430 --> 00:58:06.990 themselves that for that particular

NOTE Confidence: 0.834735614444444

00:58:06.990 --> 00:58:09.060 exposure the post Natal period maybe

NOTE Confidence: 0.834735614444444

00:58:09.060 --> 00:58:10.762 more important potentially because

NOTE Confidence: 0.834735614444444

00:58:10.762 --> 00:58:12.586 mothers are actually buffering

NOTE Confidence: 0.834735614444444

00:58:12.586 --> 00:58:17.010 their offspring against against.

NOTE Confidence: 0.834735614444444

00:58:17.010 --> 00:58:18.025 The challenges posed by a

NOTE Confidence: 0.834735614444444

00:58:18.025 --> 00:58:19.653 drought and they can do so more

NOTE Confidence: 0.834735614444444

00:58:19.653 --> 00:58:20.785 effectively when they're neutral.

NOTE Confidence: 0.834735614444444

00:58:20.790 --> 00:58:22.686 But here I'm I'm speculating a little bit,

NOTE Confidence: 0.834735614444444

00:58:22.690 --> 00:58:23.770 so sometimes we can get it,

NOTE Confidence: 0.834735614444444

00:58:23.770 --> 00:58:24.990 and sometimes we can't,

NOTE Confidence: 0.834735614444444

00:58:24.990 --> 00:58:26.210 because those correlations can

NOTE Confidence: 0.834735614444444

00:58:26.210 --> 00:58:27.512 be quite tight across that

NOTE Confidence: 0.834735614444444

00:58:27.512 --> 00:58:29.200 about a year and a half or so.

NOTE Confidence: 0.857807277142857

00:58:30.240 --> 00:58:33.628 And I think Karthik had a question.

NOTE Confidence: 0.857807277142857

00:58:33.630 --> 00:58:35.286 Great talk is really cool stuff.

NOTE Confidence: 0.857807277142857

00:58:35.290 --> 00:58:36.610 My question is kind of similar

NOTE Confidence: 0.857807277142857

00:58:36.610 --> 00:58:37.795 to Doctor Vaccarino's,

NOTE Confidence: 0.857807277142857

00:58:37.795 --> 00:58:39.090 but one of the interesting things

NOTE Confidence: 0.857807277142857

00:58:39.090 --> 00:58:41.310 was just the reduced like fertility,

NOTE Confidence: 0.857807277142857

00:58:41.310 --> 00:58:43.206 like or like having less children.

NOTE Confidence: 0.857807277142857

00:58:43.210 --> 00:58:44.418 And I mean I could think of

NOTE Confidence: 0.857807277142857

00:58:44.418 --> 00:58:45.606 a lot of causes for that.

NOTE Confidence: 0.857807277142857

00:58:45.610 --> 00:58:47.160 Like you know their eggs are less

NOTE Confidence: 0.857807277142857

00:58:47.160 --> 00:58:48.870 viable or they change their behavior

NOTE Confidence: 0.857807277142857

00:58:48.870 --> 00:58:50.730 so they're like having less like

NOTE Confidence: 0.857807277142857

00:58:50.730 --> 00:58:52.210 intercourse or the fact that like

NOTE Confidence: 0.857807277142857

00:58:52.210 --> 00:58:53.806 just 'cause of their like hierarchy,

NOTE Confidence: 0.857807277142857

00:58:53.806 --> 00:58:55.566 they just have less opportunity.

NOTE Confidence: 0.857807277142857

00:58:55.570 --> 00:58:56.562 Have you looked at?

NOTE Confidence: 0.857807277142857

00:58:56.562 --> 00:58:57.802 Like what is the actual

NOTE Confidence: 0.857807277142857

00:58:57.802 --> 00:58:58.978 like granular cause of

NOTE Confidence: 0.9062175325

00:58:58.990 --> 00:59:00.298 this change in like?

NOTE Confidence: 0.841069970909091

00:59:01.900 --> 00:59:05.236 Yeah, so in in that severe drought they

NOTE Confidence: 0.841069970909091

00:59:05.236 --> 00:59:08.044 just stopped cycling and I think the

NOTE Confidence: 0.841069970909091

00:59:08.044 --> 00:59:10.615 the rationale for that is very similar

NOTE Confidence: 0.841069970909091

00:59:10.615 --> 00:59:13.140 to reproductive biology in humans,

NOTE Confidence: 0.841069970909091

00:59:13.140 --> 00:59:16.458 which is when you know energy

NOTE Confidence: 0.841069970909091

00:59:16.458 --> 00:59:18.670 expenditures exceed energy intake.

NOTE Confidence: 0.841069970909091

00:59:18.670 --> 00:59:20.470 We stop cycling. I mean you see that,

NOTE Confidence: 0.841069970909091

00:59:20.470 --> 00:59:21.898 for example in athletes,

NOTE Confidence: 0.841069970909091

00:59:21.898 --> 00:59:25.637 but you also see it in in Syria in

NOTE Confidence: 0.841069970909091

00:59:25.637 --> 00:59:28.157 situations of severe caloric deprivation.

NOTE Confidence: 0.841069970909091

00:59:28.160 --> 00:59:29.798 Baboons have actually.

NOTE Confidence: 0.841069970909091

00:59:29.798 --> 00:59:31.436 In many ways,

NOTE Confidence: 0.841069970909091

00:59:31.440 --> 00:59:32.432 very similar reproductive biology,

NOTE Confidence: 0.841069970909091

00:59:32.432 --> 00:59:33.920 so I think that's what's happened.

NOTE Confidence: 0.841069970909091

00:59:33.920 --> 00:59:35.755 They're not getting pregnant because

NOTE Confidence: 0.841069970909091

00:59:35.755 --> 00:59:37.590 they're they're they're not ovulating.

NOTE Confidence: 0.841069970909091

00:59:37.590 --> 00:59:37.810 But

NOTE Confidence: 0.89972785

00:59:37.820 --> 00:59:39.270 that would be like 'cause

NOTE Confidence: 0.845422974545455

00:59:39.280 --> 00:59:40.930 there was differences between like the

NOTE Confidence: 0.845422974545455

00:59:40.930 --> 00:59:43.150 higher status versus the lower status,

NOTE Confidence: 0.845422974545455

00:59:43.150 --> 00:59:44.560 like the higher status it would

NOTE Confidence: 0.845422974545455

00:59:44.560 --> 00:59:45.732 affect both of them, right?

NOTE Confidence: 0.845422974545455

00:59:45.732 --> 00:59:46.660 'cause they're both starving,

NOTE Confidence: 0.845422974545455

00:59:46.660 --> 00:59:48.060 but it seemed like it wasn't as effective.

NOTE Confidence: 0.845422974545455

00:59:48.060 --> 00:59:49.803 So what would be like the mechanism

NOTE Confidence: 0.845422974545455

00:59:49.803 --> 00:59:51.208 where effects one at the other?

NOTE Confidence: 0.91379678

00:59:51.820 --> 00:59:54.764 Yeah, so that I can tell you with

NOTE Confidence: 0.91379678

00:59:54.764 --> 00:59:56.865 less certainty, but one of the reasons

NOTE Confidence: 0.91379678

00:59:56.865 --> 00:59:58.872 that being a high status female baboon

NOTE Confidence: 0.91379678

00:59:58.872 --> 01:00:00.902 is probably a nice thing to be.

NOTE Confidence: 0.91379678

01:00:00.910 --> 01:00:04.260 Is a nice thing to be is not only because

NOTE Confidence: 0.91379678

01:00:04.341 --> 01:00:06.828 they suffer reduced much less targeting,

NOTE Confidence: 0.91379678

01:00:06.828 --> 01:00:09.174 social targeting by other animals, right?

NOTE Confidence: 0.91379678

01:00:09.174 --> 01:00:11.008 There's a lot of reinforcement

NOTE Confidence: 0.91379678

01:00:11.008 --> 01:00:12.680 of hierarchies in baboons,

NOTE Confidence: 0.91379678

01:00:12.680 --> 01:00:14.752 so there's a lot of psychosocial stress

NOTE Confidence: 0.91379678

01:00:14.752 --> 01:00:17.110 as well, but because you know it,

NOTE Confidence: 0.91379678

01:00:17.110 --> 01:00:19.110 it it actually increases their

NOTE Confidence: 0.91379678

01:00:19.110 --> 01:00:20.310 access to resources.

NOTE Confidence: 0.91379678

01:00:20.310 --> 01:00:22.632 They have the ability to displace

NOTE Confidence: 0.91379678

01:00:22.632 --> 01:00:24.639 other animals from areas where

NOTE Confidence: 0.91379678

01:00:24.639 --> 01:00:26.187 food might still exist,

NOTE Confidence: 0.91379678

01:00:26.190 --> 01:00:28.388 and so I suspect that in energetic

NOTE Confidence: 0.91379678

01:00:28.388 --> 01:00:30.468 rationale has a big role to play.

NOTE Confidence: 0.91379678

01:00:30.470 --> 01:00:31.114 That's certainly.

NOTE Confidence: 0.91379678

01:00:31.114 --> 01:00:32.080 That's for example,

NOTE Confidence: 0.91379678

01:00:32.080 --> 01:00:34.208 the reason why we think females who

NOTE Confidence: 0.91379678

01:00:34.208 --> 01:00:36.358 are higher status have shorter inter

NOTE Confidence: 0.91379678

01:00:36.358 --> 01:00:37.980 birth intervals than females who

NOTE Confidence: 0.91379678

01:00:37.980 --> 01:00:39.660 are low status in our population.

NOTE Confidence: 0.91379678

01:00:39.660 --> 01:00:42.330 They just come back to reproductive

NOTE Confidence: 0.91379678

01:00:42.330 --> 01:00:43.220 condition faster.

NOTE Confidence: 0.91379678

01:00:43.220 --> 01:00:45.200 It's shorter postpartum area,

NOTE Confidence: 0.91379678

01:00:45.200 --> 01:00:46.910 interesting, cool, thanks sure.

NOTE Confidence: 0.77533422

01:00:49.950 --> 01:00:52.020 I'm very did you have a

NOTE Confidence: 0.77533422

01:00:52.020 --> 01:00:53.761 question there or Preston?

NOTE Confidence: 0.77533422

01:00:53.761 --> 01:00:57.266 Yes, Preston has a question.

NOTE Confidence: 0.77533422

01:00:57.270 --> 01:00:59.048 Question do you want to unmute there?

NOTE Confidence: 0.77533422

01:00:59.050 --> 01:01:00.480 Yep, I'm Preston hi.

NOTE Confidence: 0.9269801

01:01:03.780 --> 01:01:05.784 This was this was fascinating.

NOTE Confidence: 0.9269801

01:01:05.784 --> 01:01:08.430 I I was really intrigued by.

NOTE Confidence: 0.757721614444444

01:01:08.430 --> 01:01:10.315 I was just wondering with

NOTE Confidence: 0.757721614444444

01:01:10.315 --> 01:01:11.823 the causes of death.

NOTE Confidence: 0.757721614444444

01:01:11.830 --> 01:01:13.342 I don't know if if you knew

NOTE Confidence: 0.757721614444444

01:01:13.342 --> 01:01:14.759 any difference in the causes of

NOTE Confidence: 0.757721614444444

01:01:14.759 --> 01:01:16.199 death with those who have the

NOTE Confidence: 0.757721614444444

01:01:16.199 --> 01:01:17.569 social hits versus those who are

NOTE Confidence: 0.757721614444444

01:01:17.569 --> 01:01:19.222 able to live a long happy life

NOTE Confidence: 0.757721614444444

01:01:19.222 --> 01:01:20.938 and had that privilege kind of

NOTE Confidence: 0.757721614444444

01:01:20.938 --> 01:01:22.258 lifestyle you're talking on it.

NOTE Confidence: 0.757721614444444

01:01:22.260 --> 01:01:23.316 I don't know if there's anything

NOTE Confidence: 0.853631672

01:01:23.450 --> 01:01:27.090 on that. We have limited information on

NOTE Confidence: 0.853631672

01:01:27.090 --> 01:01:30.090 cause of death because we can't do you know,

NOTE Confidence: 0.853631672

01:01:30.090 --> 01:01:32.328 full clinical workups of dead baboons.

NOTE Confidence: 0.853631672

01:01:32.330 --> 01:01:34.245 And honestly we barely recovered

NOTE Confidence: 0.853631672

01:01:34.245 --> 01:01:36.862 their bodies in a state where we

NOTE Confidence: 0.853631672

01:01:36.862 --> 01:01:39.110 would be able to do that, right?

NOTE Confidence: 0.853631672

01:01:39.110 --> 01:01:41.140 'cause so so I'll say the the

NOTE Confidence: 0.853631672

01:01:41.140 --> 01:01:43.003 proximate cause of death for most of

NOTE Confidence: 0.853631672

01:01:43.003 --> 01:01:44.959 our animals is they got eaten by by.

NOTE Confidence: 0.853631672

01:01:44.960 --> 01:01:47.726 Leopard or a lion or something like that?

NOTE Confidence: 0.853631672

01:01:47.730 --> 01:01:50.043 You know we do see pathologies and we record

NOTE Confidence: 0.853631672

01:01:50.043 --> 01:01:52.279 wounds and pathologies over the the lifespan.

NOTE Confidence: 0.853631672

01:01:52.280 --> 01:01:54.912 But they're pretty crude and so the

NOTE Confidence: 0.853631672

01:01:54.912 --> 01:01:58.040 short answer is, we really wish we knew.

NOTE Confidence: 0.853631672

01:01:58.040 --> 01:02:00.744 But everything I showed you today is an

NOTE Confidence: 0.853631672

01:02:00.744 --> 01:02:02.877 all 'cause mortality sort of situation.

NOTE Confidence: 0.853631672

01:02:02.877 --> 01:02:04.690 We could parse some of the individuals

NOTE Confidence: 0.853631672

01:02:04.744 --> 01:02:06.016 who we have better data for,

NOTE Confidence: 0.853631672

01:02:06.020 --> 01:02:07.757 but that just drops our sample size a lot.

NOTE Confidence: 0.909937617692308

01:02:10.010 --> 01:02:11.612 Thank you I. I imagine that

NOTE Confidence: 0.909937617692308

01:02:11.612 --> 01:02:12.680 being depressed probably makes

NOTE Confidence: 0.909937617692308

01:02:12.729 --> 01:02:14.680 you more likely to be eaten,

NOTE Confidence: 0.909937617692308

01:02:14.680 --> 01:02:16.340 so I I think that's.

NOTE Confidence: 0.909937617692308

01:02:16.340 --> 01:02:18.200 It make probably makes you slower,

NOTE Confidence: 0.909937617692308

01:02:18.200 --> 01:02:20.252 probably makes you less liked by

NOTE Confidence: 0.909937617692308

01:02:20.252 --> 01:02:22.518 your your social peers if you're

NOTE Confidence: 0.909937617692308

01:02:22.518 --> 01:02:24.178 causing them difficulties too,

NOTE Confidence: 0.909937617692308

01:02:24.180 --> 01:02:25.236 so I think it makes sense.

NOTE Confidence: 0.909937617692308

01:02:25.240 --> 01:02:28.246 I just thank you this is this is great.

NOTE Confidence: 0.909937617692308

01:02:28.250 --> 01:02:29.562 Thanks, I know we've run

NOTE Confidence: 0.909937617692308

01:02:29.562 --> 01:02:30.302 a little bit over time,

NOTE Confidence: 0.909937617692308

01:02:30.310 --> 01:02:31.808 but Amanda does have her hand raised,

NOTE Confidence: 0.909937617692308

01:02:31.810 --> 01:02:32.144 so Amanda,

NOTE Confidence: 0.909937617692308

01:02:32.144 --> 01:02:33.313 would you like to ask a question?

NOTE Confidence: 0.909937617692308

01:02:34.110 --> 01:02:34.540 Thank

NOTE Confidence: 0.634611006

01:02:34.550 --> 01:02:36.460 you. Jenny is great talk.

NOTE Confidence: 0.634611006

01:02:36.460 --> 01:02:37.490 I always love hearing a research

NOTE Confidence: 0.634611006

01:02:37.490 --> 01:02:39.400 and as a treat to hear about baboons

NOTE Confidence: 0.769422722857143

01:02:40.150 --> 01:02:41.570 in a world where consumed

NOTE Confidence: 0.769422722857143

01:02:41.570 --> 01:02:46.620 by my cats. So but related.

NOTE Confidence: 0.60834654

01:02:46.620 --> 01:02:47.968 I was struck by an image near

NOTE Confidence: 0.783544387

01:02:47.980 --> 01:02:50.044 the end of your talk where a baboon

NOTE Confidence: 0.783544387

01:02:50.044 --> 01:02:53.238 mother and infant appeared to be engaging

NOTE Confidence: 0.783544387

01:02:53.238 --> 01:02:55.660 in some face to face mutual gazing,

NOTE Confidence: 0.783544387

01:02:55.660 --> 01:02:57.718 and this led me to wonder.

NOTE Confidence: 0.783544387

01:02:57.720 --> 01:02:59.592 Are you guys looking at or

NOTE Confidence: 0.783544387

01:02:59.592 --> 01:03:01.560 thinking of looking at?

NOTE Confidence: 0.783544387

01:03:01.560 --> 01:03:03.056 You know mother infant interactions

NOTE Confidence: 0.783544387

01:03:03.056 --> 01:03:05.728 in the middle period and how this

NOTE Confidence: 0.783544387

01:03:05.728 --> 01:03:08.215 might be influencing infant outcomes.

NOTE Confidence: 0.783544387

01:03:08.215 --> 01:03:09.480 Yeah, absolutely.

NOTE Confidence: 0.783544387

01:03:09.480 --> 01:03:11.940 So that was the last part

NOTE Confidence: 0.783544387

01:03:11.940 --> 01:03:13.770 of Matthew Zippel thesis,

NOTE Confidence: 0.783544387

01:03:13.770 --> 01:03:15.562 so he was the the former PhD

NOTE Confidence: 0.783544387

01:03:15.562 --> 01:03:17.786 student who did the work on

NOTE Confidence: 0.783544387

01:03:17.786 --> 01:03:18.988 intergenerational adversity, right?

NOTE Confidence: 0.783544387

01:03:18.988 --> 01:03:21.864 And so where we are there is that we think

NOTE Confidence: 0.783544387

01:03:21.864 --> 01:03:24.264 OK moms who experience early adversity.

NOTE Confidence: 0.783544387

01:03:24.270 --> 01:03:27.826 They grow up and then they have

NOTE Confidence: 0.783544387

01:03:27.826 --> 01:03:30.436 more difficulty keeping their kids

NOTE Confidence: 0.783544387

01:03:30.436 --> 01:03:32.346 alive and that's the phenomenon.

NOTE Confidence: 0.783544387

01:03:32.346 --> 01:03:34.470 But it's not the explanation right?

NOTE Confidence: 0.783544387

01:03:34.470 --> 01:03:36.036 And we think that they're having

NOTE Confidence: 0.783544387

01:03:36.036 --> 01:03:37.080 more difficulty because they

NOTE Confidence: 0.783544387

01:03:37.126 --> 01:03:38.536 themselves are in poor condition.

NOTE Confidence: 0.783544387

01:03:38.540 --> 01:03:38.756 Well,

NOTE Confidence: 0.783544387

01:03:38.756 --> 01:03:40.700 in order for that to translate to the kid,

NOTE Confidence: 0.783544387

01:03:40.700 --> 01:03:42.002 I mean there are a few different

NOTE Confidence: 0.783544387

01:03:42.002 --> 01:03:42.880 ways that could happen,

NOTE Confidence: 0.783544387

01:03:42.880 --> 01:03:45.724 but one is certainly in their

NOTE Confidence: 0.783544387

01:03:45.724 --> 01:03:47.620 interaction and caretaking style,

NOTE Confidence: 0.783544387

01:03:47.620 --> 01:03:50.110 and so he's been aggregating very

NOTE Confidence: 0.783544387

01:03:50.110 --> 01:03:52.787 very granular data on mother infant

NOTE Confidence: 0.783544387

01:03:52.787 --> 01:03:55.595 pairs to try and understand what

NOTE Confidence: 0.783544387

01:03:55.595 --> 01:03:57.819 the differences in sort of very,

NOTE Confidence: 0.783544387

01:03:57.820 --> 01:04:00.226 very granular levels of experience are

NOTE Confidence: 0.783544387

01:04:00.226 --> 01:04:03.400 for the kids of moms who have those.

NOTE Confidence: 0.783544387

01:04:03.400 --> 01:04:05.048 Those adverse early experiences

NOTE Confidence: 0.783544387

01:04:05.048 --> 01:04:06.696 versus those that don't,

NOTE Confidence: 0.783544387

01:04:06.700 --> 01:04:08.590 and they certainly appear to be different.

NOTE Confidence: 0.783544387

01:04:08.590 --> 01:04:10.585 Although not in ways that we completely

NOTE Confidence: 0.783544387

01:04:10.585 --> 01:04:12.160 have our fingers on yet right,

NOTE Confidence: 0.783544387

01:04:12.160 --> 01:04:13.924 they spend more time with adult males.

NOTE Confidence: 0.783544387

01:04:13.930 --> 01:04:14.954 For instance,

NOTE Confidence: 0.783544387

01:04:14.954 --> 01:04:18.538 they spend more time away from Mom.

NOTE Confidence: 0.783544387

01:04:18.540 --> 01:04:20.952 Who is driving that behavior

NOTE Confidence: 0.783544387

01:04:20.952 --> 01:04:23.392 is not entirely clear yet,

NOTE Confidence: 0.783544387

01:04:23.400 --> 01:04:25.680 but hopefully we'll get a little

NOTE Confidence: 0.783544387

01:04:25.680 --> 01:04:28.268 bit more more of an understanding

NOTE Confidence: 0.783544387

01:04:28.268 --> 01:04:30.553 as as that analysis proceeds.

NOTE Confidence: 0.783544387

01:04:30.560 --> 01:04:31.550 I want to see thank you.

NOTE Confidence: 0.68817834

01:04:33.390 --> 01:04:34.950 I know we are, we're time,

NOTE Confidence: 0.68817834

01:04:34.950 --> 01:04:36.840 but I if there are any trainees

NOTE Confidence: 0.68817834

01:04:36.840 --> 01:04:38.833 that are still on the line that

NOTE Confidence: 0.68817834

01:04:38.833 --> 01:04:40.519 would like to ask any questions

NOTE Confidence: 0.68817834

01:04:40.584 --> 01:04:42.576 please do now is your opportunity.

NOTE Confidence: 0.68817834

01:04:42.580 --> 01:04:44.458 Any other questions from the audience?

NOTE Confidence: 0.733530794285714

01:04:48.480 --> 01:04:49.656 And you know, I just when I,

NOTE Confidence: 0.733530794285714

01:04:49.660 --> 01:04:51.516 when you're presenting your

NOTE Confidence: 0.733530794285714

01:04:51.516 --> 01:04:52.908 developmental constraints versus

NOTE Confidence: 0.733530794285714

01:04:52.910 --> 01:04:54.422 the predictive adaptive response,

NOTE Confidence: 0.733530794285714

01:04:54.422 --> 01:04:55.934 really resonated with me.

NOTE Confidence: 0.733530794285714

01:04:55.940 --> 01:04:56.420 Because obviously,

NOTE Confidence: 0.733530794285714

01:04:56.420 --> 01:04:58.736 with the kind of work I do with exposure

NOTE Confidence: 0.733530794285714

01:04:58.736 --> 01:05:00.456 to prenatal anxiety or depression,

NOTE Confidence: 0.733530794285714

01:05:00.460 --> 01:05:02.115 you know the clinical implications

NOTE Confidence: 0.733530794285714

01:05:02.115 --> 01:05:03.770 of saying the predictive adaptive

NOTE Confidence: 0.733530794285714

01:05:03.822 --> 01:05:05.037 response is the best fit.

NOTE Confidence: 0.733530794285714

01:05:05.040 --> 01:05:07.180 Model is actually really appalling,

NOTE Confidence: 0.733530794285714

01:05:07.180 --> 01:05:09.484 because it suggests that you shouldn't

NOTE Confidence: 0.733530794285714

01:05:09.484 --> 01:05:10.743 treat anxiety or depression.

NOTE Confidence: 0.733530794285714

01:05:10.743 --> 01:05:12.780 Pregnancy obviously makes no sense at all,

NOTE Confidence: 0.733530794285714

01:05:12.780 --> 01:05:14.292 so I can't really subscribe to

NOTE Confidence: 0.733530794285714

01:05:14.292 --> 01:05:15.300 the predictive adaptive response.

NOTE Confidence: 0.733530794285714

01:05:15.300 --> 01:05:16.950 And in the context, so.

NOTE Confidence: 0.733530794285714

01:05:16.950 --> 01:05:18.335 Mental anxiety and depression or

NOTE Confidence: 0.733530794285714

01:05:18.335 --> 01:05:19.443 perinatal anxiety and depression.

NOTE Confidence: 0.733530794285714

01:05:19.450 --> 01:05:20.346 So the developmental constraint

NOTE Confidence: 0.733530794285714

01:05:20.346 --> 01:05:21.927 model really seems to fit a little

NOTE Confidence: 0.733530794285714

01:05:21.927 --> 01:05:23.285 bit better with the data that I've

NOTE Confidence: 0.733530794285714

01:05:23.285 --> 01:05:24.738 seen from my my own research as well,

NOTE Confidence: 0.704986357142857

01:05:25.210 --> 01:05:27.387 you know, Karen, as you probably have,

NOTE Confidence: 0.704986357142857

01:05:27.390 --> 01:05:29.364 I've seen a couple of papers that

NOTE Confidence: 0.704986357142857

01:05:29.364 --> 01:05:31.148 actually do go down that path.

NOTE Confidence: 0.704986357142857

01:05:31.150 --> 01:05:34.430 Yeah, well, we shouldn't try to

NOTE Confidence: 0.704986357142857

01:05:34.430 --> 01:05:36.270 address this because you know,

NOTE Confidence: 0.704986357142857

01:05:36.270 --> 01:05:38.910 the phenotype is meant to be matched.

NOTE Confidence: 0.704986357142857

01:05:38.910 --> 01:05:42.278 And I, I think I think that's problematic

NOTE Confidence: 0.704986357142857

01:05:42.278 --> 01:05:45.319 from a variety of perspectives.

NOTE Confidence: 0.704986357142857

01:05:45.320 --> 01:05:48.694 And beyond, whether or not one hypothesis,

NOTE Confidence: 0.704986357142857

01:05:48.700 --> 01:05:50.408 one class of models is a better

NOTE Confidence: 0.704986357142857

01:05:50.408 --> 01:05:51.460 explanation versus the other,

NOTE Confidence: 0.704986357142857

01:05:51.460 --> 01:05:55.080 it also seriously conflates what

NOTE Confidence: 0.704986357142857

01:05:55.080 --> 01:05:57.446 evolution may have produced with what we

NOTE Confidence: 0.704986357142857

01:05:57.446 --> 01:05:59.937 might want our societies to look like.

NOTE Confidence: 0.704986357142857

01:05:59.940 --> 01:06:02.136 And those are not not always

NOTE Confidence: 0.704986357142857

01:06:02.136 --> 01:06:03.665 the same thing, right?

NOTE Confidence: 0.704986357142857

01:06:03.665 --> 01:06:04.090 So

NOTE Confidence: 0.782804899090909

01:06:04.820 --> 01:06:06.905 exactly. Yeah, well, we've got

NOTE Confidence: 0.782804899090909

01:06:06.905 --> 01:06:09.390 messages coming and saying great talk.

NOTE Confidence: 0.782804899090909

01:06:09.390 --> 01:06:10.548 I'd just like to reiterate that

NOTE Confidence: 0.782804899090909

01:06:10.548 --> 01:06:11.829 and thank you once again Jenny,

NOTE Confidence: 0.782804899090909

01:06:11.830 --> 01:06:13.886 you have an open invitation to New Haven.

NOTE Confidence: 0.782804899090909

01:06:13.890 --> 01:06:14.730 We will get you here.

NOTE Confidence: 0.782804899090909

01:06:14.730 --> 01:06:17.106 We will make that pizza comparison

NOTE Confidence: 0.782804899090909

01:06:17.106 --> 01:06:18.690 happen that we promised.

NOTE Confidence: 0.782804899090909

01:06:18.690 --> 01:06:20.922 But please join me once again in thanking Dr.

NOTE Confidence: 0.782804899090909

01:06:20.930 --> 01:06:22.460 Chung for a wonderful presentation.

NOTE Confidence: 0.792568132

01:06:22.950 --> 01:06:24.676 Thanks to all of you. I really

NOTE Confidence: 0.792568132

01:06:24.676 --> 01:06:25.691 appreciate the opportunity to do

NOTE Confidence: 0.792568132

01:06:25.691 --> 01:06:27.060 this and I'm sorry I couldn't be

NOTE Confidence: 0.780239430909091

01:06:27.070 --> 01:06:28.498 with you in person.

NOTE Confidence: 0.780239430909091

01:06:28.498 --> 01:06:31.320 Oh my God will make it happen.

NOTE Confidence: 0.780239430909091

01:06:31.320 --> 01:06:32.370 Wonderful, I think we'll stop

NOTE Confidence: 0.780239430909091

01:06:32.370 --> 01:06:33.420 the recording that bye bye.

NOTE Confidence: 0.780239430909091

01:06:33.420 --> 01:06:34.998 Jennie thanks bye.