

WEBVTT

NOTE duration:"00:29:20.210000"

NOTE recognizability:0.850

NOTE language:en-us

NOTE Confidence: 0.8407624925

00:00:05.610 --> 00:00:07.461 Good afternoon, everyone.

NOTE Confidence: 0.8407624925

00:00:07.461 --> 00:00:10.546 Welcome to the opera sheet.

NOTE Confidence: 0.8407624925

00:00:10.550 --> 00:00:12.594 And so I'm also very excited to

NOTE Confidence: 0.8407624925

00:00:12.594 --> 00:00:14.917 be back at this great meeting

NOTE Confidence: 0.8407624925

00:00:14.917 --> 00:00:16.745 after the three-year break.

NOTE Confidence: 0.8407624925

00:00:16.750 --> 00:00:18.046 And I'm also excited to present

NOTE Confidence: 0.8407624925

00:00:18.046 --> 00:00:19.469 some of my work here today,

NOTE Confidence: 0.8407624925

00:00:19.470 --> 00:00:21.070 which is on multimodal

NOTE Confidence: 0.8407624925

00:00:21.070 --> 00:00:23.070 analysis and autism within the

NOTE Confidence: 0.8407624925

00:00:23.070 --> 00:00:24.790 context of phase processes.

NOTE Confidence: 0.906052152222222

00:00:27.830 --> 00:00:31.064 OK. So autism is a very common

NOTE Confidence: 0.906052152222222

00:00:31.064 --> 00:00:31.988 neurodevelopmental condition.

NOTE Confidence: 0.906052152222222

00:00:31.990 --> 00:00:34.430 So it occurs in roughly like one person,

NOTE Confidence: 0.906052152222222

00:00:34.430 --> 00:00:35.794 one in 44 people,  
NOTE Confidence: 0.9060521522222222

00:00:35.794 --> 00:00:37.840 and it is characterized by social  
NOTE Confidence: 0.9060521522222222

00:00:37.912 --> 00:00:40.021 communicative difficulties and  
NOTE Confidence: 0.9060521522222222

00:00:40.021 --> 00:00:42.130 restricted repetitive behaviors.  
NOTE Confidence: 0.9060521522222222

00:00:42.130 --> 00:00:44.962 And autism is also still exclusively  
NOTE Confidence: 0.9060521522222222

00:00:44.962 --> 00:00:47.570 diagnosed based on behavioral symptoms,  
NOTE Confidence: 0.9060521522222222

00:00:47.570 --> 00:00:50.250 which is pretty much the case for any  
NOTE Confidence: 0.9060521522222222

00:00:50.250 --> 00:00:51.608 psychiatric condition as we know.  
NOTE Confidence: 0.9060521522222222

00:00:51.610 --> 00:00:53.238 But because of this,  
NOTE Confidence: 0.9060521522222222

00:00:53.238 --> 00:00:55.680 our goal is to eventually develop  
NOTE Confidence: 0.9060521522222222

00:00:55.758 --> 00:00:57.868 biomarkers that can help us.  
NOTE Confidence: 0.9060521522222222

00:00:57.870 --> 00:01:00.160 Diagnose the condition more objectively  
NOTE Confidence: 0.9060521522222222

00:01:00.160 --> 00:01:03.356 and also to identify more targeted  
NOTE Confidence: 0.9060521522222222

00:01:03.356 --> 00:01:06.746 support services which help individuals.  
NOTE Confidence: 0.9060521522222222

00:01:06.750 --> 00:01:08.266 And for this reason,  
NOTE Confidence: 0.9060521522222222

00:01:08.266 --> 00:01:10.161 it's of course really important

NOTE Confidence: 0.906052152222222  
00:01:10.161 --> 00:01:12.605 that we better understand the  
NOTE Confidence: 0.906052152222222  
00:01:12.605 --> 00:01:14.601 neurobiological underpinnings of the  
NOTE Confidence: 0.906052152222222  
00:01:14.601 --> 00:01:17.130 condition and its clinical features.  
NOTE Confidence: 0.906052152222222  
00:01:17.130 --> 00:01:18.654 And in this context,  
NOTE Confidence: 0.906052152222222  
00:01:18.654 --> 00:01:21.902 there has been a lot of neuroimaging  
NOTE Confidence: 0.906052152222222  
00:01:21.902 --> 00:01:24.882 studies conducted already to date  
NOTE Confidence: 0.906052152222222  
00:01:24.882 --> 00:01:27.522 and so many different neuroimaging  
NOTE Confidence: 0.906052152222222  
00:01:27.522 --> 00:01:30.985 modalities have been applied that try  
NOTE Confidence: 0.906052152222222  
00:01:30.985 --> 00:01:33.333 to characterize different biological  
NOTE Confidence: 0.906052152222222  
00:01:33.333 --> 00:01:37.009 aspects of the condition and its  
NOTE Confidence: 0.906052152222222  
00:01:37.009 --> 00:01:38.809 associated features individually.  
NOTE Confidence: 0.906052152222222  
00:01:38.810 --> 00:01:40.550 But then the question is,  
NOTE Confidence: 0.906052152222222  
00:01:40.550 --> 00:01:43.329 can we maybe obtain a more holistic  
NOTE Confidence: 0.906052152222222  
00:01:43.329 --> 00:01:45.052 understanding of the neurobiology  
NOTE Confidence: 0.906052152222222  
00:01:45.052 --> 00:01:47.788 of autism if we study different?  
NOTE Confidence: 0.906052152222222

00:01:47.790 --> 00:01:49.590 Modalities in combination.  
NOTE Confidence: 0.909642775714286

00:01:52.280 --> 00:01:55.330 This is what happens on  
NOTE Confidence: 0.909642775714286

00:01:55.330 --> 00:01:57.710 transatlantic flights. OK.  
NOTE Confidence: 0.909642775714286

00:01:57.710 --> 00:02:03.485 So luckily it is quite normal that we  
NOTE Confidence: 0.909642775714286

00:02:03.485 --> 00:02:05.305 acquire multimodal neuroimaging data  
NOTE Confidence: 0.909642775714286

00:02:05.305 --> 00:02:08.828 and like MRI data from the same subject  
NOTE Confidence: 0.909642775714286

00:02:08.830 --> 00:02:12.046 when we conduct new imaging analysis.  
NOTE Confidence: 0.909642775714286

00:02:12.050 --> 00:02:15.252 And the reason why we do so is because  
NOTE Confidence: 0.909642775714286

00:02:15.252 --> 00:02:17.664 we know that every modality captures  
NOTE Confidence: 0.909642775714286

00:02:17.664 --> 00:02:20.038 like different unique aspects of the  
NOTE Confidence: 0.909642775714286

00:02:20.038 --> 00:02:21.868 neural organization of the brain.  
NOTE Confidence: 0.909642775714286

00:02:21.870 --> 00:02:23.103 So for example,  
NOTE Confidence: 0.909642775714286

00:02:23.103 --> 00:02:25.980 EG has very high temporal resolution and  
NOTE Confidence: 0.909642775714286

00:02:26.054 --> 00:02:29.209 most accurately reflects neuronal activity.  
NOTE Confidence: 0.909642775714286

00:02:29.210 --> 00:02:30.656 And then MRI is you know,  
NOTE Confidence: 0.909642775714286

00:02:30.660 --> 00:02:32.725 has very high spatial resolution

NOTE Confidence: 0.909642775714286  
00:02:32.725 --> 00:02:34.790 and provides more detailed insights  
NOTE Confidence: 0.909642775714286  
00:02:34.853 --> 00:02:36.908 into the structural and functional  
NOTE Confidence: 0.909642775714286  
00:02:36.908 --> 00:02:38.552 organization of the brain.  
NOTE Confidence: 0.909642775714286  
00:02:38.560 --> 00:02:43.166 And then depending on our research question.  
NOTE Confidence: 0.909642775714286  
00:02:43.170 --> 00:02:45.408 Um, we study these different aspects  
NOTE Confidence: 0.909642775714286  
00:02:45.408 --> 00:02:47.690 either individually or in combination.  
NOTE Confidence: 0.909642775714286  
00:02:47.690 --> 00:02:49.430 But what we usually do is,  
NOTE Confidence: 0.909642775714286  
00:02:49.430 --> 00:02:52.030 is we conduct unimodal analysis.  
NOTE Confidence: 0.909642775714286  
00:02:52.030 --> 00:02:54.580 So we study each modality individually  
NOTE Confidence: 0.909642775714286  
00:02:54.580 --> 00:02:57.387 and search for like disease or  
NOTE Confidence: 0.909642775714286  
00:02:57.387 --> 00:02:59.439 like phenotype related changes  
NOTE Confidence: 0.909642775714286  
00:02:59.439 --> 00:03:01.491 in each modality separately.  
NOTE Confidence: 0.827341665  
00:03:05.360 --> 00:03:08.222 However, we know that like any  
NOTE Confidence: 0.827341665  
00:03:08.222 --> 00:03:10.269 single imaging, modality alone can  
NOTE Confidence: 0.827341665  
00:03:10.269 --> 00:03:12.810 only provide a limited view into the  
NOTE Confidence: 0.827341665

00:03:12.880 --> 00:03:15.060 neural organization of the brain,  
NOTE Confidence: 0.827341665

00:03:15.060 --> 00:03:17.405 and there should be certain benefits to  
NOTE Confidence: 0.827341665

00:03:17.405 --> 00:03:19.020 combining different imaging modalities.  
NOTE Confidence: 0.827341665

00:03:19.020 --> 00:03:20.808 And so the most obvious benefits  
NOTE Confidence: 0.827341665

00:03:20.808 --> 00:03:22.000 are first of all,  
NOTE Confidence: 0.827341665

00:03:22.000 --> 00:03:23.776 it should be biologically more valid,  
NOTE Confidence: 0.827341665

00:03:23.780 --> 00:03:26.144 of course, because we know that  
NOTE Confidence: 0.827341665

00:03:26.144 --> 00:03:28.232 neural changes occur across different  
NOTE Confidence: 0.827341665

00:03:28.232 --> 00:03:30.866 biological systems at the same time.  
NOTE Confidence: 0.827341665

00:03:30.870 --> 00:03:31.450 Theoretically,  
NOTE Confidence: 0.827341665

00:03:31.450 --> 00:03:35.597 we would also expect a greater signal  
NOTE Confidence: 0.827341665

00:03:35.597 --> 00:03:39.251 to noise ratio and like greater  
NOTE Confidence: 0.827341665

00:03:39.251 --> 00:03:41.800 sensitivity to detect effects.  
NOTE Confidence: 0.827341665

00:03:41.800 --> 00:03:43.186 And it should also give us  
NOTE Confidence: 0.827341665

00:03:43.186 --> 00:03:44.472 probably like a more comprehensive  
NOTE Confidence: 0.827341665

00:03:44.472 --> 00:03:46.326 view of the question we study.

NOTE Confidence: 0.860169311

00:03:53.870 --> 00:03:56.038 So this figure I borrowed from one of

NOTE Confidence: 0.860169311

00:03:56.038 --> 00:03:58.198 Minsk Yahoo's papers and it shows you

NOTE Confidence: 0.860169311

00:03:58.198 --> 00:03:59.763 that there are different approaches

NOTE Confidence: 0.860169311

00:03:59.822 --> 00:04:01.492 to doing multimodal analysis and

NOTE Confidence: 0.860169311

00:04:01.492 --> 00:04:03.492 depending on which approach we adopt,

NOTE Confidence: 0.860169311

00:04:03.492 --> 00:04:05.746 we can increase the amount of the

NOTE Confidence: 0.860169311

00:04:05.746 --> 00:04:08.132 shared joint variance that we extract

NOTE Confidence: 0.860169311

00:04:08.132 --> 00:04:09.804 from the different modalities.

NOTE Confidence: 0.860169311

00:04:09.810 --> 00:04:12.586 So the most simple or like the simplest

NOTE Confidence: 0.860169311

00:04:12.586 --> 00:04:15.342 way would be to do unimodal analysis

NOTE Confidence: 0.860169311

00:04:15.342 --> 00:04:18.040 and then visually compare our unimodal.

NOTE Confidence: 0.860169311

00:04:18.040 --> 00:04:19.990 Results or like do unimodal analysis

NOTE Confidence: 0.860169311

00:04:19.990 --> 00:04:21.810 and then overlay our results.

NOTE Confidence: 0.860169311

00:04:21.810 --> 00:04:23.738 So these of course can be very useful,

NOTE Confidence: 0.860169311

00:04:23.740 --> 00:04:26.393 but they would not account for any

NOTE Confidence: 0.860169311

00:04:26.393 --> 00:04:28.310 interactions between the modalities.  
NOTE Confidence: 0.860169311

00:04:28.310 --> 00:04:30.704 The next level would be asymmetric  
NOTE Confidence: 0.860169311

00:04:30.704 --> 00:04:33.164 fusion and that's when one modality  
NOTE Confidence: 0.860169311

00:04:33.164 --> 00:04:35.528 is used to restrict another one,  
NOTE Confidence: 0.860169311

00:04:35.530 --> 00:04:38.666 like for example in F MRI seated  
NOTE Confidence: 0.860169311

00:04:38.666 --> 00:04:40.995 EG reconstruction or like when  
NOTE Confidence: 0.860169311

00:04:40.995 --> 00:04:42.795 we Co register images.  
NOTE Confidence: 0.860169311

00:04:42.800 --> 00:04:45.452 And then finally the most powerful  
NOTE Confidence: 0.860169311

00:04:45.452 --> 00:04:47.790 technique would be symmetric fusion,  
NOTE Confidence: 0.860169311

00:04:47.790 --> 00:04:49.986 where we can extract most of  
NOTE Confidence: 0.860169311

00:04:49.986 --> 00:04:51.450 the shared common variants.  
NOTE Confidence: 0.860169311

00:04:51.450 --> 00:04:54.892 So this means that we would merge the data  
NOTE Confidence: 0.860169311

00:04:54.892 --> 00:04:56.788 before the statistical interpretation  
NOTE Confidence: 0.860169311

00:04:56.788 --> 00:04:59.615 stage and model the cross subject  
NOTE Confidence: 0.860169311

00:04:59.615 --> 00:05:01.835 variability in a data-driven way.  
NOTE Confidence: 0.899290825

00:05:05.070 --> 00:05:06.792 And so there are different methods

NOTE Confidence: 0.899290825

00:05:06.792 --> 00:05:09.149 of course to do multimodal analysis.

NOTE Confidence: 0.899290825

00:05:09.150 --> 00:05:12.102 So earlier Maria showed us how you can

NOTE Confidence: 0.899290825

00:05:12.102 --> 00:05:13.887 do structure, function and coupling.

NOTE Confidence: 0.899290825

00:05:13.887 --> 00:05:16.330 And then what we usually do at

NOTE Confidence: 0.899290825

00:05:16.400 --> 00:05:18.620 Donders is so-called linked

NOTE Confidence: 0.899290825

00:05:18.620 --> 00:05:20.285 independent component analysis.

NOTE Confidence: 0.899290825

00:05:20.290 --> 00:05:22.354 So the toolbox for this was

NOTE Confidence: 0.899290825

00:05:22.354 --> 00:05:24.450 developed by Alberto Yera at donors,

NOTE Confidence: 0.899290825

00:05:24.450 --> 00:05:25.716 also Christian Beckman.

NOTE Confidence: 0.899290825

00:05:25.716 --> 00:05:27.826 And as you can see,

NOTE Confidence: 0.899290825

00:05:27.830 --> 00:05:30.110 it's pretty much an extension

NOTE Confidence: 0.899290825

00:05:30.110 --> 00:05:31.934 of single modality ICA,

NOTE Confidence: 0.899290825

00:05:31.940 --> 00:05:34.472 which you know is like a

NOTE Confidence: 0.899290825

00:05:34.472 --> 00:05:35.738 multivariate data-driven method

NOTE Confidence: 0.899290825

00:05:35.738 --> 00:05:39.136 to decompose the MRI data into

NOTE Confidence: 0.899290825

00:05:39.136 --> 00:05:40.879 statistically independent components.  
NOTE Confidence: 0.899290825

00:05:40.880 --> 00:05:42.588 And different spatial patterns  
NOTE Confidence: 0.899290825

00:05:42.588 --> 00:05:44.296 and associated time courses.  
NOTE Confidence: 0.899290825

00:05:44.300 --> 00:05:46.418 And so here the difference is  
NOTE Confidence: 0.899290825

00:05:46.420 --> 00:05:49.030 it's a Bayesian tensor extension  
NOTE Confidence: 0.899290825

00:05:49.030 --> 00:05:51.118 of single modality ICA,  
NOTE Confidence: 0.899290825

00:05:51.120 --> 00:05:54.120 with the difference that we decompose  
NOTE Confidence: 0.899290825

00:05:54.120 --> 00:05:56.490 the data simultaneously across the.  
NOTE Confidence: 0.899290825

00:05:56.490 --> 00:05:57.950 Different modalities.  
NOTE Confidence: 0.748777238

00:06:00.590 --> 00:06:02.030 Yeah. And as a result,  
NOTE Confidence: 0.748777238

00:06:02.030 --> 00:06:04.208 we would then get independent components  
NOTE Confidence: 0.748777238

00:06:04.208 --> 00:06:06.559 and these are then associated with  
NOTE Confidence: 0.748777238

00:06:06.559 --> 00:06:08.629 spatial maps for each modality,  
NOTE Confidence: 0.748777238

00:06:08.630 --> 00:06:10.778 but with one shared subject course.  
NOTE Confidence: 0.748777238

00:06:10.780 --> 00:06:12.244 And this is the key feature  
NOTE Confidence: 0.748777238

00:06:12.244 --> 00:06:13.582 that the subject course is

NOTE Confidence: 0.748777238

00:06:13.582 --> 00:06:14.810 shared across the modalities.

NOTE Confidence: 0.748777238

00:06:14.810 --> 00:06:16.658 And this then you can use to like

NOTE Confidence: 0.748777238

00:06:16.658 --> 00:06:18.365 relate it to different clinical

NOTE Confidence: 0.748777238

00:06:18.365 --> 00:06:20.345 features or like behavioral measures.

NOTE Confidence: 0.855014635909091

00:06:23.370 --> 00:06:25.575 OK, so few years ago Alberto already

NOTE Confidence: 0.855014635909091

00:06:25.575 --> 00:06:27.845 published a paper using this method and

NOTE Confidence: 0.855014635909091

00:06:27.845 --> 00:06:30.149 showed how about a powerful tool it is.

NOTE Confidence: 0.855014635909091

00:06:30.150 --> 00:06:32.562 So here he applied linked independent

NOTE Confidence: 0.855014635909091

00:06:32.562 --> 00:06:34.642 component analysis to all structural

NOTE Confidence: 0.855014635909091

00:06:34.642 --> 00:06:37.435 imaging modalities in the HCP data set.

NOTE Confidence: 0.855014635909091

00:06:37.440 --> 00:06:40.009 And he found a set of different

NOTE Confidence: 0.855014635909091

00:06:40.009 --> 00:06:41.938 independent components and that of which

NOTE Confidence: 0.855014635909091

00:06:41.938 --> 00:06:43.970 many related to like the whole range of

NOTE Confidence: 0.855014635909091

00:06:44.029 --> 00:06:46.150 behavioral measures that we have in HCP.

NOTE Confidence: 0.855014635909091

00:06:46.150 --> 00:06:47.406 And here for example,

NOTE Confidence: 0.855014635909091

00:06:47.406 --> 00:06:49.290 you can see one very significant  
NOTE Confidence: 0.855014635909091

00:06:49.350 --> 00:06:50.630 independent component.  
NOTE Confidence: 0.855014635909091

00:06:50.630 --> 00:06:52.646 And so these maps are the spatial.  
NOTE Confidence: 0.855014635909091

00:06:52.650 --> 00:06:55.674 Steps per modality as you can see.  
NOTE Confidence: 0.855014635909091

00:06:55.680 --> 00:06:57.976 So the interesting thing here was that  
NOTE Confidence: 0.855014635909091

00:06:57.976 --> 00:07:00.270 all modalities that he fed into the  
NOTE Confidence: 0.855014635909091

00:07:00.270 --> 00:07:01.825 model contributed to this component  
NOTE Confidence: 0.855014635909091

00:07:01.825 --> 00:07:03.756 and it was also very significantly  
NOTE Confidence: 0.855014635909091

00:07:03.756 --> 00:07:06.220 related to a whole range of different  
NOTE Confidence: 0.855014635909091

00:07:06.220 --> 00:07:08.020 cognitive behavioral measures such  
NOTE Confidence: 0.855014635909091

00:07:08.020 --> 00:07:09.820 as like cognitive functioning,  
NOTE Confidence: 0.855014635909091

00:07:09.820 --> 00:07:12.060 mental health, things like that.  
NOTE Confidence: 0.855014635909091

00:07:12.060 --> 00:07:13.964 So this is just to briefly show you  
NOTE Confidence: 0.855014635909091

00:07:13.964 --> 00:07:16.054 that it works nicely across structure  
NOTE Confidence: 0.855014635909091

00:07:16.054 --> 00:07:17.606 structural imaging modalities and  
NOTE Confidence: 0.855014635909091

00:07:17.606 --> 00:07:20.566 it's a great tool to elucidate brain

NOTE Confidence: 0.855014635909091  
00:07:20.566 --> 00:07:22.266 behavior relationships across modeling.  
NOTE Confidence: 0.880863866  
00:07:25.520 --> 00:07:27.360 But then, as I said,  
NOTE Confidence: 0.880863866  
00:07:27.360 --> 00:07:29.225 I'm interested in studying the  
NOTE Confidence: 0.880863866  
00:07:29.225 --> 00:07:31.822 neurobiology of autism and so I'm more  
NOTE Confidence: 0.880863866  
00:07:31.822 --> 00:07:33.832 interested to apply this method in  
NOTE Confidence: 0.880863866  
00:07:33.832 --> 00:07:35.855 a clinical context and characterize  
NOTE Confidence: 0.880863866  
00:07:35.855 --> 00:07:38.851 the neuro phenotype of autism cross modally.  
NOTE Confidence: 0.880863866  
00:07:38.860 --> 00:07:42.178 And luckily we have a very comprehensive  
NOTE Confidence: 0.880863866  
00:07:42.178 --> 00:07:44.894 and deeply phenotype data set available  
NOTE Confidence: 0.880863866  
00:07:44.894 --> 00:07:48.660 within the EU aims aims to trials consortium.  
NOTE Confidence: 0.880863866  
00:07:48.660 --> 00:07:51.540 So this is the largest consortium  
NOTE Confidence: 0.880863866  
00:07:51.540 --> 00:07:53.915 in Europe designed to discover  
NOTE Confidence: 0.880863866  
00:07:53.915 --> 00:07:56.190 biomarkers and drugs and autism.  
NOTE Confidence: 0.880863866  
00:07:56.190 --> 00:07:58.630 And this is a data set available with  
NOTE Confidence: 0.880863866  
00:07:58.630 --> 00:08:00.852 over 700 autistic and non autistic  
NOTE Confidence: 0.880863866

00:08:00.852 --> 00:08:03.162 individuals and at the same time  
NOTE Confidence: 0.880863866

00:08:03.231 --> 00:08:05.487 many different imaging modalities.  
NOTE Confidence: 0.880863866

00:08:05.490 --> 00:08:07.940 So structural MRI DTI is you can  
NOTE Confidence: 0.880863866

00:08:07.940 --> 00:08:09.973 see resting stata from our task  
NOTE Confidence: 0.880863866

00:08:09.973 --> 00:08:12.600 fMRI we also have EG and then like  
NOTE Confidence: 0.880863866

00:08:12.600 --> 00:08:15.252 a whole range of different clinical  
NOTE Confidence: 0.880863866

00:08:15.252 --> 00:08:18.250 and cognitive measures available.  
NOTE Confidence: 0.880863866

00:08:18.250 --> 00:08:20.749 So it's really one of the most  
NOTE Confidence: 0.880863866

00:08:20.749 --> 00:08:22.323 multimodal datasets and largest  
NOTE Confidence: 0.880863866

00:08:22.323 --> 00:08:24.067 ones available in autism.  
NOTE Confidence: 0.880863866

00:08:24.070 --> 00:08:27.171 So it's actually ideally suited to do  
NOTE Confidence: 0.880863866

00:08:27.171 --> 00:08:29.259 multimodal imaging analysis in autism.  
NOTE Confidence: 0.87531335

00:08:32.250 --> 00:08:35.211 OK. So the first study I would like to  
NOTE Confidence: 0.87531335

00:08:35.211 --> 00:08:37.228 touch on and here we asked the question,  
NOTE Confidence: 0.87531335

00:08:37.230 --> 00:08:39.320 what does the multimodal neural  
NOTE Confidence: 0.87531335

00:08:39.320 --> 00:08:41.410 signature of autism look like?

NOTE Confidence: 0.87531335

00:08:41.410 --> 00:08:43.090 And here we didn't have

NOTE Confidence: 0.87531335

00:08:43.090 --> 00:08:44.098 any specific hypothesis.

NOTE Confidence: 0.87531335

00:08:44.100 --> 00:08:46.890 We just looked at like the

NOTE Confidence: 0.87531335

00:08:46.890 --> 00:08:48.750 global cross modal pattern.

NOTE Confidence: 0.87531335

00:08:48.750 --> 00:08:50.472 And this study was led by one

NOTE Confidence: 0.87531335

00:08:50.472 --> 00:08:52.510 of our PhD students at Donners,

NOTE Confidence: 0.87531335

00:08:52.510 --> 00:08:55.080 Leonard Oblong.

NOTE Confidence: 0.87531335

00:08:55.080 --> 00:08:57.456 And so here we use this UAMS data set

NOTE Confidence: 0.87531335

00:08:57.456 --> 00:08:59.977 that I just showed you and integrated

NOTE Confidence: 0.87531335

00:08:59.977 --> 00:09:01.994 imaging data across three different

NOTE Confidence: 0.87531335

00:09:01.994 --> 00:09:04.459 modalities which were structural MRI,

NOTE Confidence: 0.87531335

00:09:04.460 --> 00:09:07.400 resting state F, MRI and DTI.

NOTE Confidence: 0.87531335

00:09:07.400 --> 00:09:09.925 All analysis and features were

NOTE Confidence: 0.87531335

00:09:09.925 --> 00:09:11.945 also restricted to specific

NOTE Confidence: 0.87531335

00:09:11.945 --> 00:09:14.040 cortical and subcortical ROI.

NOTE Confidence: 0.87531335

00:09:14.040 --> 00:09:15.832 Which had previously been  
NOTE Confidence: 0.87531335

00:09:15.832 --> 00:09:17.782 implicated in autism, such as,  
NOTE Confidence: 0.87531335

00:09:17.782 --> 00:09:19.287 for example, post central gyrus,  
NOTE Confidence: 0.87531335

00:09:19.290 --> 00:09:21.879 amygdala, fusiform gyrus.  
NOTE Confidence: 0.87531335

00:09:21.880 --> 00:09:23.842 And then we did the unimodal  
NOTE Confidence: 0.87531335

00:09:23.842 --> 00:09:25.150 feature extraction which was,  
NOTE Confidence: 0.87531335

00:09:25.150 --> 00:09:26.254 as you can see,  
NOTE Confidence: 0.87531335

00:09:26.254 --> 00:09:27.634 BM for the structural domain,  
NOTE Confidence: 0.87531335

00:09:27.640 --> 00:09:30.170 then connect topic mapping for  
NOTE Confidence: 0.87531335

00:09:30.170 --> 00:09:32.700 resting state fMRI and probabilistic  
NOTE Confidence: 0.87531335

00:09:32.785 --> 00:09:34.900 tractography for DTI and then  
NOTE Confidence: 0.87531335

00:09:34.900 --> 00:09:37.400 went on and applied linked ICA.  
NOTE Confidence: 0.87531335

00:09:37.400 --> 00:09:38.880 To merge these different modalities  
NOTE Confidence: 0.87531335

00:09:38.880 --> 00:09:40.360 and then eventually you would  
NOTE Confidence: 0.87531335

00:09:40.410 --> 00:09:41.865 obtain the subject courses that  
NOTE Confidence: 0.87531335

00:09:41.865 --> 00:09:43.320 are shared across the modalities

NOTE Confidence: 0.87531335

00:09:43.375 --> 00:09:45.223 and these can then be studied in

NOTE Confidence: 0.87531335

00:09:45.223 --> 00:09:46.540 association with behavior for example.

NOTE Confidence: 0.933966478333333

00:09:49.290 --> 00:09:52.791 OK. So on the bottom you can see the

NOTE Confidence: 0.933966478333333

00:09:52.791 --> 00:09:55.220 different independent components.

NOTE Confidence: 0.933966478333333

00:09:55.220 --> 00:09:58.070 These are now 22 in total.

NOTE Confidence: 0.933966478333333

00:09:58.070 --> 00:09:59.725 The color stands for one

NOTE Confidence: 0.933966478333333

00:09:59.725 --> 00:10:01.380 modality and so depending on

NOTE Confidence: 0.933966478333333

00:10:01.445 --> 00:10:03.317 the component that we look at,

NOTE Confidence: 0.933966478333333

00:10:03.320 --> 00:10:05.600 you can see that there are

NOTE Confidence: 0.933966478333333

00:10:05.600 --> 00:10:07.120 more or less multimodal.

NOTE Confidence: 0.933966478333333

00:10:07.120 --> 00:10:10.448 Is 22 were the ones that were either

NOTE Confidence: 0.933966478333333

00:10:10.448 --> 00:10:13.339 related to some behavioral measures

NOTE Confidence: 0.933966478333333

00:10:13.339 --> 00:10:16.609 like adaptive daily living skills,

NOTE Confidence: 0.933966478333333

00:10:16.610 --> 00:10:17.945 autism associated features,

NOTE Confidence: 0.933966478333333

00:10:17.945 --> 00:10:20.170 or they showed a significant

NOTE Confidence: 0.933966478333333

00:10:20.170 --> 00:10:21.060 group difference.  
NOTE Confidence: 0.8864320125

00:10:24.560 --> 00:10:28.870 And so the most interesting one among these  
NOTE Confidence: 0.8864320125

00:10:28.870 --> 00:10:31.690 independent components was this one here,  
NOTE Confidence: 0.8864320125

00:10:31.690 --> 00:10:33.190 because it showed a significant  
NOTE Confidence: 0.8864320125

00:10:33.190 --> 00:10:34.390 group difference between autistic  
NOTE Confidence: 0.8864320125

00:10:34.390 --> 00:10:35.830 and non autistic individuals.  
NOTE Confidence: 0.8864320125

00:10:35.830 --> 00:10:37.144 Or the autistic group as you can see here,  
NOTE Confidence: 0.8864320125

00:10:37.150 --> 00:10:40.678 like a lower contribution on this component.  
NOTE Confidence: 0.8864320125

00:10:40.680 --> 00:10:43.110 And the next you can.  
NOTE Confidence: 0.8864320125

00:10:43.110 --> 00:10:46.092 Look at the spatial profile and the  
NOTE Confidence: 0.8864320125

00:10:46.092 --> 00:10:47.370 individual modality contributions  
NOTE Confidence: 0.8864320125

00:10:47.436 --> 00:10:49.460 and as you can see we BM contributed  
NOTE Confidence: 0.8864320125

00:10:49.460 --> 00:10:51.726 to a very small extent and this  
NOTE Confidence: 0.8864320125

00:10:51.726 --> 00:10:54.226 was mostly driven by resting state  
NOTE Confidence: 0.8864320125

00:10:54.226 --> 00:10:58.206 fMRI within the fusiform gyrus.  
NOTE Confidence: 0.8864320125

00:10:58.210 --> 00:11:01.186 So, taken together in this study,

NOTE Confidence: 0.8864320125

00:11:01.190 --> 00:11:04.494 the most interesting result was not in

NOTE Confidence: 0.8864320125

00:11:04.494 --> 00:11:06.730 a particularly multimodal component,

NOTE Confidence: 0.8864320125

00:11:06.730 --> 00:11:09.400 but it was still interesting to

NOTE Confidence: 0.8864320125

00:11:09.400 --> 00:11:11.846 see this group difference within

NOTE Confidence: 0.8864320125

00:11:11.846 --> 00:11:15.356 the fusiform gyrus and also some

NOTE Confidence: 0.8864320125

00:11:15.356 --> 00:11:17.111 nominally significant associations.

NOTE Confidence: 0.8864320125

00:11:17.120 --> 00:11:17.670 But yeah.

NOTE Confidence: 0.932360397777778

00:11:19.990 --> 00:11:23.147 The reason why we were excited to

NOTE Confidence: 0.932360397777778

00:11:23.147 --> 00:11:26.022 see this strong implication of the

NOTE Confidence: 0.932360397777778

00:11:26.022 --> 00:11:29.390 fusiform gyrus is because it has been

NOTE Confidence: 0.932360397777778

00:11:29.390 --> 00:11:31.770 atypically implicated in autism before.

NOTE Confidence: 0.932360397777778

00:11:31.770 --> 00:11:33.912 So there are many unimodal studies

NOTE Confidence: 0.932360397777778

00:11:33.912 --> 00:11:35.578 that show that autistic individuals,

NOTE Confidence: 0.932360397777778

00:11:35.578 --> 00:11:37.334 for example, show hyperactivation

NOTE Confidence: 0.932360397777778

00:11:37.334 --> 00:11:40.144 while doing face matching tasks,

NOTE Confidence: 0.932360397777778

00:11:40.150 --> 00:11:43.830 or they would show like a delayed and  
NOTE Confidence: 0.932360397777778

00:11:43.830 --> 00:11:46.949 170 response in response to phases  
NOTE Confidence: 0.932360397777778

00:11:46.949 --> 00:11:50.099 when doing EEG acquisition or like.  
NOTE Confidence: 0.932360397777778

00:11:50.100 --> 00:11:52.350 A structurally and they for example,  
NOTE Confidence: 0.932360397777778

00:11:52.350 --> 00:11:55.464 atypical asymmetry or like increased or  
NOTE Confidence: 0.932360397777778

00:11:55.464 --> 00:11:58.450 decreased volume depending on the region.  
NOTE Confidence: 0.932360397777778

00:11:58.450 --> 00:12:02.140 So it has typically been implicated  
NOTE Confidence: 0.932360397777778

00:12:02.140 --> 00:12:03.370 in autism.  
NOTE Confidence: 0.932360397777778

00:12:03.370 --> 00:12:05.130 And another important thing is  
NOTE Confidence: 0.932360397777778

00:12:05.130 --> 00:12:07.363 that it's a key feature associated  
NOTE Confidence: 0.932360397777778

00:12:07.363 --> 00:12:09.769 with face processing as we know.  
NOTE Confidence: 0.932360397777778

00:12:09.770 --> 00:12:11.831 And so you can see here that it's kind  
NOTE Confidence: 0.932360397777778

00:12:11.831 --> 00:12:14.762 of like a mosaic with like different  
NOTE Confidence: 0.932360397777778

00:12:14.762 --> 00:12:16.526 differently functionally specialized regions.  
NOTE Confidence: 0.932360397777778

00:12:16.530 --> 00:12:19.015 So there are these like  
NOTE Confidence: 0.932360397777778

00:12:19.015 --> 00:12:21.003 circumscribes patches like for.

NOTE Confidence: 0.932360397777778  
00:12:21.010 --> 00:12:22.876 That are like responsible for places,  
NOTE Confidence: 0.932360397777778  
00:12:22.880 --> 00:12:24.064 processing shapes,  
NOTE Confidence: 0.932360397777778  
00:12:24.064 --> 00:12:25.840 words and faces,  
NOTE Confidence: 0.932360397777778  
00:12:25.840 --> 00:12:28.500 but it's like the key region that's  
NOTE Confidence: 0.932360397777778  
00:12:28.500 --> 00:12:30.839 active when you process phases.  
NOTE Confidence: 0.932360397777778  
00:12:30.840 --> 00:12:34.354 And what's also important here is that  
NOTE Confidence: 0.932360397777778  
00:12:34.354 --> 00:12:37.041 atypical phase processing has been shown to  
NOTE Confidence: 0.932360397777778  
00:12:37.041 --> 00:12:39.649 be one of the most commonly cited social  
NOTE Confidence: 0.932360397777778  
00:12:39.649 --> 00:12:41.797 difficulties in autistic individuals,  
NOTE Confidence: 0.932360397777778  
00:12:41.800 --> 00:12:44.929 who they Orient much less to faces.  
NOTE Confidence: 0.932360397777778  
00:12:44.930 --> 00:12:48.062 But they also have difficulties understanding  
NOTE Confidence: 0.932360397777778  
00:12:48.062 --> 00:12:50.880 or like recognizing facial emotions.  
NOTE Confidence: 0.932360397777778  
00:12:50.880 --> 00:12:51.262 OK.  
NOTE Confidence: 0.932360397777778  
00:12:51.262 --> 00:12:53.852 So this is just a brief overview  
NOTE Confidence: 0.932360397777778  
00:12:53.852 --> 00:12:55.604 or context of the fusiform gyrus.  
NOTE Confidence: 0.932360397777778

00:12:55.610 --> 00:12:58.081 So the next study makes more sense  
NOTE Confidence: 0.932360397777778

00:12:58.081 --> 00:13:00.034 because based on Leonard's results.  
NOTE Confidence: 0.932360397777778

00:13:00.034 --> 00:13:02.716 And based on these unimodal prior  
NOTE Confidence: 0.932360397777778

00:13:02.716 --> 00:13:04.858 results or literature in autism  
NOTE Confidence: 0.932360397777778

00:13:04.858 --> 00:13:07.588 and I decided to apply this linked  
NOTE Confidence: 0.932360397777778

00:13:07.667 --> 00:13:10.223 ICA method to the fusiform gyrus  
NOTE Confidence: 0.932360397777778

00:13:10.223 --> 00:13:12.295 specifically and asked what does  
NOTE Confidence: 0.932360397777778

00:13:12.295 --> 00:13:13.755 the multimodal neural signature  
NOTE Confidence: 0.932360397777778

00:13:13.755 --> 00:13:15.946 of phase processing look like in  
NOTE Confidence: 0.932360397777778

00:13:15.946 --> 00:13:17.466 the fusiform gyrus and autism?  
NOTE Confidence: 0.8281232

00:13:20.190 --> 00:13:23.046 So here I also merged them  
NOTE Confidence: 0.8281232

00:13:23.046 --> 00:13:24.474 different imaging modalities,  
NOTE Confidence: 0.8281232

00:13:24.480 --> 00:13:26.180 so also structure and resting  
NOTE Confidence: 0.8281232

00:13:26.180 --> 00:13:27.880 state fMRI as Leonard did,  
NOTE Confidence: 0.8281232

00:13:27.880 --> 00:13:30.136 but it also included additionally 2  
NOTE Confidence: 0.8281232

00:13:30.136 --> 00:13:32.221 functional modalities that were specifically

NOTE Confidence: 0.8281232

00:13:32.221 --> 00:13:34.289 associated with phase processing,

NOTE Confidence: 0.8281232

00:13:34.290 --> 00:13:37.550 so EG and task fMRI.

NOTE Confidence: 0.8281232

00:13:37.550 --> 00:13:43.110 So for EG there was ERP data available

NOTE Confidence: 0.8281232

00:13:43.110 --> 00:13:45.618 for those recorded when subjects looked

NOTE Confidence: 0.8281232

00:13:45.618 --> 00:13:48.262 like upright or inverted phases and

NOTE Confidence: 0.8281232

00:13:48.262 --> 00:13:51.846 for task fMRI this was acquired when

NOTE Confidence: 0.8281232

00:13:51.846 --> 00:13:54.590 subject performed the Hariri face

NOTE Confidence: 0.8281232

00:13:54.590 --> 00:13:57.295 matching paradigm in the scanner.

NOTE Confidence: 0.8281232

00:13:57.300 --> 00:13:59.628 And I told you that this UM sample

NOTE Confidence: 0.8281232

00:13:59.628 --> 00:14:01.960 is actually quite big that but then

NOTE Confidence: 0.8281232

00:14:01.960 --> 00:14:04.158 when we take the intersecting sample

NOTE Confidence: 0.8281232

00:14:04.158 --> 00:14:06.428 across all the different modalities,

NOTE Confidence: 0.8281232

00:14:06.430 --> 00:14:07.865 that's available for all the

NOTE Confidence: 0.8281232

00:14:07.865 --> 00:14:09.740 individuals and also with good quality.

NOTE Confidence: 0.8281232

00:14:09.740 --> 00:14:11.606 This actually boils down to a

NOTE Confidence: 0.8281232

00:14:11.606 --> 00:14:13.670 sample of around 200 individuals.  
NOTE Confidence: 0.932329001

00:14:16.370 --> 00:14:19.856 OK, so we can look at the  
NOTE Confidence: 0.932329001

00:14:19.856 --> 00:14:21.350 different methodological steps.  
NOTE Confidence: 0.932329001

00:14:21.350 --> 00:14:23.066 First of all, I restricted all  
NOTE Confidence: 0.932329001

00:14:23.066 --> 00:14:25.282 analysis to the left and the right  
NOTE Confidence: 0.932329001

00:14:25.282 --> 00:14:26.630 fusiform gyrus separately because  
NOTE Confidence: 0.932329001

00:14:26.630 --> 00:14:29.270 we know face processing is the right  
NOTE Confidence: 0.932329001

00:14:29.270 --> 00:14:30.842 lateralized cognitive function and  
NOTE Confidence: 0.932329001

00:14:30.842 --> 00:14:34.955 it actually makes sense to study the  
NOTE Confidence: 0.932329001

00:14:34.955 --> 00:14:36.950 hemispheric contributions individually.  
NOTE Confidence: 0.932329001

00:14:36.950 --> 00:14:38.670 Then for the structural domain,  
NOTE Confidence: 0.932329001

00:14:38.670 --> 00:14:41.620 I am extracted Gray matter  
NOTE Confidence: 0.932329001

00:14:41.620 --> 00:14:43.410 volumes based on VM.  
NOTE Confidence: 0.932329001

00:14:43.410 --> 00:14:46.620 And for task F MRI we used the  
NOTE Confidence: 0.932329001

00:14:46.620 --> 00:14:49.670 contrast maps for the phases  
NOTE Confidence: 0.932329001

00:14:49.670 --> 00:14:52.720 greater than shapes condition from

NOTE Confidence: 0.932329001

00:14:52.820 --> 00:14:55.920 this Hariri phase matching task.

NOTE Confidence: 0.932329001

00:14:55.920 --> 00:14:59.886 And for resting state F MRI I computed

NOTE Confidence: 0.932329001

00:14:59.886 --> 00:15:03.564 connectivity gradients or connect topic maps.

NOTE Confidence: 0.932329001

00:15:03.570 --> 00:15:07.202 And this is actually the same approach that

NOTE Confidence: 0.932329001

00:15:07.202 --> 00:15:10.089 Michael introduced before in the hippocampus.

NOTE Confidence: 0.932329001

00:15:10.090 --> 00:15:12.418 So you correlate each voxel within

NOTE Confidence: 0.932329001

00:15:12.418 --> 00:15:14.440 the fusiform gyrus with the voxels

NOTE Confidence: 0.932329001

00:15:14.440 --> 00:15:15.850 and the rest of the cortex.

NOTE Confidence: 0.932329001

00:15:15.850 --> 00:15:19.828 Then you can compute the similarity

NOTE Confidence: 0.932329001

00:15:19.828 --> 00:15:23.749 matrix and derive Laplacian eigen maps.

NOTE Confidence: 0.932329001

00:15:23.750 --> 00:15:26.324 And this then reflects the connectivity

NOTE Confidence: 0.932329001

00:15:26.324 --> 00:15:28.391 gradient within the fusiform gyrus

NOTE Confidence: 0.932329001

00:15:28.391 --> 00:15:30.663 and it it makes actually sense to use

NOTE Confidence: 0.932329001

00:15:30.663 --> 00:15:32.997 a spatial model like this because

NOTE Confidence: 0.932329001

00:15:32.997 --> 00:15:34.982 of this fine grained functional

NOTE Confidence: 0.932329001

00:15:34.990 --> 00:15:37.270 heterogeneity within the fusiform gyrus.

NOTE Confidence: 0.816974254

00:15:39.410 --> 00:15:41.990 OK, and then for EEG,

NOTE Confidence: 0.816974254

00:15:41.990 --> 00:15:43.634 we did source reconstruction

NOTE Confidence: 0.816974254

00:15:43.634 --> 00:15:45.689 with interviews of from gyrus,

NOTE Confidence: 0.816974254

00:15:45.690 --> 00:15:47.850 so we reconstructed them the time

NOTE Confidence: 0.816974254

00:15:47.850 --> 00:15:49.290 series from different locations

NOTE Confidence: 0.816974254

00:15:49.349 --> 00:15:50.789 within the fusiform gyrus.

NOTE Confidence: 0.794306632

00:15:55.820 --> 00:15:57.120 Then as a next step,

NOTE Confidence: 0.794306632

00:15:57.120 --> 00:15:59.385 I applied normative modeling to

NOTE Confidence: 0.794306632

00:15:59.385 --> 00:16:01.197 each imaging modality separately.

NOTE Confidence: 0.794306632

00:16:01.200 --> 00:16:03.320 And so we have the true experts on

NOTE Confidence: 0.794306632

00:16:03.320 --> 00:16:04.698 normative modeling from the donors

NOTE Confidence: 0.794306632

00:16:04.698 --> 00:16:06.646 in the audience, Charlotte and Sage.

NOTE Confidence: 0.794306632

00:16:06.646 --> 00:16:10.376 And So what I did here was I computed

NOTE Confidence: 0.794306632

00:16:10.376 --> 00:16:12.786 the mapping between the brain

NOTE Confidence: 0.794306632

00:16:12.786 --> 00:16:15.452 features and age, sex and site.

NOTE Confidence: 0.794306632

00:16:15.452 --> 00:16:18.280 And with this we derived the values

NOTE Confidence: 0.794306632

00:16:18.367 --> 00:16:21.657 which quantify how much each modality and

NOTE Confidence: 0.794306632

00:16:21.657 --> 00:16:25.298 differs or like deviates from a normative.

NOTE Confidence: 0.794306632

00:16:25.300 --> 00:16:28.121 Pattern at the box lower at the

NOTE Confidence: 0.794306632

00:16:28.121 --> 00:16:31.658 time series level, time Point left.

NOTE Confidence: 0.794306632

00:16:31.660 --> 00:16:35.812 And then next these Z values or deviations

NOTE Confidence: 0.794306632

00:16:35.812 --> 00:16:39.610 were fed into the linked ICA model.

NOTE Confidence: 0.794306632

00:16:39.610 --> 00:16:42.354 So this is where you merge the different

NOTE Confidence: 0.794306632

00:16:42.354 --> 00:16:44.610 modalities using linked ICA and as I said,

NOTE Confidence: 0.794306632

00:16:44.610 --> 00:16:46.850 as a result we get how much each

NOTE Confidence: 0.794306632

00:16:46.850 --> 00:16:48.446 modality contributes and also how

NOTE Confidence: 0.794306632

00:16:48.446 --> 00:16:49.746 much each subject contributes.

NOTE Confidence: 0.794306632

00:16:49.750 --> 00:16:52.235 And this is this cross subject variability

NOTE Confidence: 0.794306632

00:16:52.235 --> 00:16:55.534 that we can then also use to study it

NOTE Confidence: 0.794306632

00:16:55.534 --> 00:16:57.859 and association with behavior or like

NOTE Confidence: 0.794306632

00:16:57.859 --> 00:16:59.879 some clinical features of interest.  
NOTE Confidence: 0.913527932

00:17:03.470 --> 00:17:06.074 OK, so here you can see the  
NOTE Confidence: 0.913527932

00:17:06.074 --> 00:17:07.190 resulting independent components.  
NOTE Confidence: 0.913527932

00:17:07.190 --> 00:17:09.390 These are the multimodal ones.  
NOTE Confidence: 0.913527932

00:17:09.390 --> 00:17:11.600 So linked ICA would also  
NOTE Confidence: 0.913527932

00:17:11.600 --> 00:17:13.430 theoretically give you unimodal ones.  
NOTE Confidence: 0.913527932

00:17:13.430 --> 00:17:15.105 But here I'm interested in  
NOTE Confidence: 0.913527932

00:17:15.105 --> 00:17:16.110 the multimodal components,  
NOTE Confidence: 0.913527932

00:17:16.110 --> 00:17:18.546 which are the ones where one modality  
NOTE Confidence: 0.913527932

00:17:18.546 --> 00:17:20.509 does not contribute more than 80%.  
NOTE Confidence: 0.913527932

00:17:20.510 --> 00:17:21.818 As you can see,  
NOTE Confidence: 0.913527932

00:17:21.818 --> 00:17:23.780 they're also divided into right and  
NOTE Confidence: 0.913527932

00:17:23.847 --> 00:17:26.092 left hemispheres separately and sorted  
NOTE Confidence: 0.913527932

00:17:26.092 --> 00:17:28.660 by how multimodal they actually are.  
NOTE Confidence: 0.913527932

00:17:28.660 --> 00:17:30.886 We can say that the right in  
NOTE Confidence: 0.913527932

00:17:30.886 --> 00:17:32.840 the left hemisphere had like

NOTE Confidence: 0.913527932

00:17:32.840 --> 00:17:34.696 roughly equal contributions here.

NOTE Confidence: 0.913527932

00:17:34.700 --> 00:17:37.514 And overall, EG had the largest contribution,

NOTE Confidence: 0.913527932

00:17:37.520 --> 00:17:41.390 whereas VBM had the smallest contributions.

NOTE Confidence: 0.913527932

00:17:41.390 --> 00:17:44.645 Next weekend and also check what the

NOTE Confidence: 0.913527932

00:17:44.645 --> 00:17:46.769 functional meaning or implications

NOTE Confidence: 0.913527932

00:17:46.769 --> 00:17:49.979 of these multimodal components are.

NOTE Confidence: 0.913527932

00:17:49.980 --> 00:17:51.744 So, for example,

NOTE Confidence: 0.913527932

00:17:51.744 --> 00:17:55.272 we can check how these multimodal

NOTE Confidence: 0.913527932

00:17:55.272 --> 00:17:57.499 components relate together.

NOTE Confidence: 0.913527932

00:17:57.500 --> 00:17:58.577 So not individually,

NOTE Confidence: 0.913527932

00:17:58.577 --> 00:18:00.731 but like in the spirit of

NOTE Confidence: 0.913527932

00:18:00.731 --> 00:18:01.720 multimodal analysis,

NOTE Confidence: 0.913527932

00:18:01.720 --> 00:18:04.330 how they relate together to different

NOTE Confidence: 0.913527932

00:18:04.330 --> 00:18:06.070 cognitive constructs that are

NOTE Confidence: 0.913527932

00:18:06.135 --> 00:18:08.703 relevant in the context of social

NOTE Confidence: 0.913527932

00:18:08.703 --> 00:18:10.415 functioning and face processing.

NOTE Confidence: 0.913527932

00:18:10.420 --> 00:18:12.470 And so a way to do this is by a

NOTE Confidence: 0.913527932

00:18:12.543 --> 00:18:16.130 canonical correlation analysis, which.

NOTE Confidence: 0.913527932

00:18:16.130 --> 00:18:18.850 Basically identifies a multivariate

NOTE Confidence: 0.913527932

00:18:18.850 --> 00:18:21.570 association between brain related

NOTE Confidence: 0.913527932

00:18:21.570 --> 00:18:25.460 features and like a set of social

NOTE Confidence: 0.913527932

00:18:25.460 --> 00:18:27.905 communicative features that we choose.

NOTE Confidence: 0.913527932

00:18:27.910 --> 00:18:29.320 And as you can see here,

NOTE Confidence: 0.913527932

00:18:29.320 --> 00:18:31.850 this resulted in a significant

NOTE Confidence: 0.913527932

00:18:31.850 --> 00:18:33.368 association between between

NOTE Confidence: 0.913527932

00:18:33.368 --> 00:18:35.839 the two sets of variables.

NOTE Confidence: 0.913527932

00:18:35.840 --> 00:18:37.916 You can also see that they

NOTE Confidence: 0.913527932

00:18:37.916 --> 00:18:40.880 differently load onto.

NOTE Confidence: 0.913527932

00:18:40.880 --> 00:18:43.400 This result so some independent

NOTE Confidence: 0.913527932

00:18:43.400 --> 00:18:45.920 components loaded more than others.

NOTE Confidence: 0.913527932

00:18:45.920 --> 00:18:47.878 The same applied to the social

NOTE Confidence: 0.913527932

00:18:47.878 --> 00:18:48.754 cognitive features.

NOTE Confidence: 0.913527932

00:18:48.754 --> 00:18:51.382 And what was also interesting was

NOTE Confidence: 0.913527932

00:18:51.382 --> 00:18:54.325 when we reran this with like other

NOTE Confidence: 0.913527932

00:18:54.325 --> 00:18:55.945 measures related to restricted

NOTE Confidence: 0.913527932

00:18:56.013 --> 00:18:58.473 repetitive behaviors and like sensory

NOTE Confidence: 0.913527932

00:18:58.473 --> 00:19:00.933 processing like non social features

NOTE Confidence: 0.913527932

00:19:00.940 --> 00:19:02.480 this was no longer significant.

NOTE Confidence: 0.913527932

00:19:02.480 --> 00:19:04.928 So it points to some specificity

NOTE Confidence: 0.913527932

00:19:04.928 --> 00:19:06.560 in the social communicative

NOTE Confidence: 0.913527932

00:19:06.637 --> 00:19:08.337 domain and phase process.

NOTE Confidence: 0.837568453529412

00:19:10.970 --> 00:19:13.210 OK. And then we can check our any

NOTE Confidence: 0.837568453529412

00:19:13.210 --> 00:19:14.605 component significantly different between

NOTE Confidence: 0.837568453529412

00:19:14.605 --> 00:19:16.570 autistic and non autistic individuals.

NOTE Confidence: 0.837568453529412

00:19:16.570 --> 00:19:19.114 And there was one component that

NOTE Confidence: 0.837568453529412

00:19:19.114 --> 00:19:20.810 significantly differed where autistic

NOTE Confidence: 0.837568453529412

00:19:20.872 --> 00:19:23.024 individuals had significantly lower  
NOTE Confidence: 0.837568453529412

00:19:23.024 --> 00:19:25.714 contributions than non autistic individuals.  
NOTE Confidence: 0.837568453529412

00:19:25.720 --> 00:19:28.797 This was a component that was driven  
NOTE Confidence: 0.837568453529412

00:19:28.797 --> 00:19:31.179 by task fMRI, resting state fMRI,  
NOTE Confidence: 0.837568453529412

00:19:31.180 --> 00:19:33.636 EEG and also to a small extent VBM.  
NOTE Confidence: 0.837568453529412

00:19:33.640 --> 00:19:36.260 So actually all modalities contributed  
NOTE Confidence: 0.837568453529412

00:19:36.260 --> 00:19:38.892 that we fed into the model just  
NOTE Confidence: 0.837568453529412

00:19:38.892 --> 00:19:41.380 to like varying degrees. Umm.  
NOTE Confidence: 0.873506556153846

00:19:43.530 --> 00:19:46.546 Here also the right hemisphere had a larger  
NOTE Confidence: 0.873506556153846

00:19:46.546 --> 00:19:48.800 contribution which is interesting in the  
NOTE Confidence: 0.873506556153846

00:19:48.800 --> 00:19:50.954 context of like the lateralized phase  
NOTE Confidence: 0.873506556153846

00:19:51.016 --> 00:19:53.446 processing effects that we would expect.  
NOTE Confidence: 0.873506556153846

00:19:53.450 --> 00:19:55.935 And you can also see the different  
NOTE Confidence: 0.873506556153846

00:19:55.935 --> 00:19:58.429 spatial maps for each modality and  
NOTE Confidence: 0.873506556153846

00:19:58.429 --> 00:20:00.689 the different regions within the  
NOTE Confidence: 0.873506556153846

00:20:00.689 --> 00:20:02.960 fusiform gyrus that load positively

NOTE Confidence: 0.873506556153846  
00:20:02.960 --> 00:20:05.485 or negatively onto this component.  
NOTE Confidence: 0.873506556153846  
00:20:05.490 --> 00:20:08.496 And then so here in this case where we  
NOTE Confidence: 0.873506556153846  
00:20:08.496 --> 00:20:11.537 see the significant group difference.  
NOTE Confidence: 0.873506556153846  
00:20:11.540 --> 00:20:14.200 We can then say that in the  
NOTE Confidence: 0.873506556153846  
00:20:14.200 --> 00:20:15.340 positive yellowish regions,  
NOTE Confidence: 0.873506556153846  
00:20:15.340 --> 00:20:17.860 autistic individuals loaded more,  
NOTE Confidence: 0.873506556153846  
00:20:17.860 --> 00:20:19.750 had lower loadings,  
NOTE Confidence: 0.873506556153846  
00:20:19.750 --> 00:20:21.295 whereas in the bluish regions  
NOTE Confidence: 0.873506556153846  
00:20:21.295 --> 00:20:22.840 higher loadings onto this component.  
NOTE Confidence: 0.873506556153846  
00:20:22.840 --> 00:20:25.570 And then depending on the modality we  
NOTE Confidence: 0.873506556153846  
00:20:25.570 --> 00:20:27.621 could interpret this accordingly that  
NOTE Confidence: 0.873506556153846  
00:20:27.621 --> 00:20:30.449 they had like larger or like smaller  
NOTE Confidence: 0.873506556153846  
00:20:30.449 --> 00:20:32.940 volume or higher or lower activation.  
NOTE Confidence: 0.873506556153846  
00:20:32.940 --> 00:20:33.330 Hmm.  
NOTE Confidence: 0.861059899333333  
00:20:35.440 --> 00:20:38.062 And then we can further characterize  
NOTE Confidence: 0.861059899333333

00:20:38.062 --> 00:20:41.007 this component by looking at the  
NOTE Confidence: 0.861059899333333

00:20:41.007 --> 00:20:42.696 different modality contributions.  
NOTE Confidence: 0.861059899333333

00:20:42.700 --> 00:20:45.268 For example, if you look at the temporal  
NOTE Confidence: 0.861059899333333

00:20:45.268 --> 00:20:47.880 profile of EG and the different time  
NOTE Confidence: 0.861059899333333

00:20:47.880 --> 00:20:50.550 points that most strongly load onto.  
NOTE Confidence: 0.861059899333333

00:20:50.550 --> 00:20:52.804 This component we can see that this  
NOTE Confidence: 0.861059899333333

00:20:52.804 --> 00:20:55.260 was the case at like 100 and 72180 and  
NOTE Confidence: 0.850213565789474

00:20:57.770 --> 00:20:58.552 450 milliseconds.  
NOTE Confidence: 0.850213565789474

00:20:58.552 --> 00:21:00.507 And this was quite interesting  
NOTE Confidence: 0.850213565789474

00:21:00.507 --> 00:21:03.082 because we know that for example the  
NOTE Confidence: 0.850213565789474

00:21:03.082 --> 00:21:05.878 face sensitive ERP occurs at N 170.  
NOTE Confidence: 0.850213565789474

00:21:05.878 --> 00:21:09.262 Which is associated with phase processing  
NOTE Confidence: 0.850213565789474

00:21:09.262 --> 00:21:13.890 and expertise to social stimuli and  
NOTE Confidence: 0.850213565789474

00:21:13.890 --> 00:21:16.530 between 280 and 500 milliseconds for  
NOTE Confidence: 0.850213565789474

00:21:16.530 --> 00:21:19.934 example we see the P300 and it's  
NOTE Confidence: 0.850213565789474

00:21:19.934 --> 00:21:22.494 sub components P3AP3B and these also

NOTE Confidence: 0.850213565789474  
00:21:22.494 --> 00:21:24.324 have been associated with learning,  
NOTE Confidence: 0.850213565789474  
00:21:24.330 --> 00:21:26.590 novelty detection things like that.  
NOTE Confidence: 0.850213565789474  
00:21:26.590 --> 00:21:29.262 So yeah I'm not big expert but it  
NOTE Confidence: 0.850213565789474  
00:21:29.262 --> 00:21:31.554 was interesting to see that this  
NOTE Confidence: 0.850213565789474  
00:21:31.554 --> 00:21:33.106 inter subject variability and  
NOTE Confidence: 0.850213565789474  
00:21:33.106 --> 00:21:34.985 like group differences occurred  
NOTE Confidence: 0.850213565789474  
00:21:34.985 --> 00:21:36.360 at these time points that.  
NOTE Confidence: 0.850213565789474  
00:21:36.360 --> 00:21:39.138 Are actually meaningful.  
NOTE Confidence: 0.850213565789474  
00:21:39.140 --> 00:21:42.644 And then for the the remaining modalities,  
NOTE Confidence: 0.850213565789474  
00:21:42.644 --> 00:21:44.664 we can further look into  
NOTE Confidence: 0.850213565789474  
00:21:44.664 --> 00:21:45.876 the spatial profiling,  
NOTE Confidence: 0.850213565789474  
00:21:45.880 --> 00:21:46.988 characterize these for example  
NOTE Confidence: 0.850213565789474  
00:21:46.988 --> 00:21:48.373 overlay them with an Atlas  
NOTE Confidence: 0.850213565789474  
00:21:48.373 --> 00:21:49.817 like the Harvard Oxford Atlas.  
NOTE Confidence: 0.850213565789474  
00:21:49.820 --> 00:21:50.980 And then we see, OK,  
NOTE Confidence: 0.850213565789474

00:21:50.980 --> 00:21:53.380 most of the group differences occurred  
NOTE Confidence: 0.850213565789474

00:21:53.380 --> 00:21:56.117 mostly like in more posterior regions  
NOTE Confidence: 0.850213565789474

00:21:56.117 --> 00:21:58.777 or like posterior occipital regions.  
NOTE Confidence: 0.850213565789474

00:21:58.780 --> 00:22:01.139 You could also overlay it with the.  
NOTE Confidence: 0.850213565789474

00:22:01.140 --> 00:22:02.266 Functional Atlas.  
NOTE Confidence: 0.850213565789474

00:22:02.266 --> 00:22:05.644 So there's this visual functional Atlas.  
NOTE Confidence: 0.850213565789474

00:22:05.650 --> 00:22:06.913 Which was created,  
NOTE Confidence: 0.850213565789474

00:22:06.913 --> 00:22:09.018 so they ran different functional  
NOTE Confidence: 0.850213565789474

00:22:09.018 --> 00:22:10.887 localizer task and so it does.  
NOTE Confidence: 0.850213565789474

00:22:10.890 --> 00:22:13.698 Atlas was then created and characterizes  
NOTE Confidence: 0.850213565789474

00:22:13.698 --> 00:22:15.570 this functional heterogeneity within  
NOTE Confidence: 0.850213565789474

00:22:15.632 --> 00:22:17.712 the fusiform gyrus and describes  
NOTE Confidence: 0.850213565789474

00:22:17.712 --> 00:22:18.983 these different categories,  
NOTE Confidence: 0.850213565789474

00:22:18.983 --> 00:22:21.148 specific category specific patches and  
NOTE Confidence: 0.850213565789474

00:22:21.148 --> 00:22:24.390 we can see that there is some overlap.  
NOTE Confidence: 0.850213565789474

00:22:24.390 --> 00:22:26.640 So for example they autistic individuals

NOTE Confidence: 0.850213565789474  
00:22:26.640 --> 00:22:28.761 show decreased volume in like more  
NOTE Confidence: 0.850213565789474  
00:22:28.761 --> 00:22:30.700 in the more retinal topic areas of  
NOTE Confidence: 0.850213565789474  
00:22:30.700 --> 00:22:33.814 the fusiform gyrus also in the right.  
NOTE Confidence: 0.850213565789474  
00:22:33.814 --> 00:22:36.269 To the form face area,  
NOTE Confidence: 0.850213565789474  
00:22:36.270 --> 00:22:39.024 but the initial increased values for  
NOTE Confidence: 0.850213565789474  
00:22:39.024 --> 00:22:41.674 the resting state modality, for example.  
NOTE Confidence: 0.850213565789474  
00:22:41.674 --> 00:22:44.523 So this probably shows us that it's  
NOTE Confidence: 0.850213565789474  
00:22:44.523 --> 00:22:47.089 more like the posterior regions,  
NOTE Confidence: 0.850213565789474  
00:22:47.090 --> 00:22:49.330 but like that are involved more in  
NOTE Confidence: 0.850213565789474  
00:22:49.330 --> 00:22:51.069 early visual processing are involved,  
NOTE Confidence: 0.850213565789474  
00:22:51.070 --> 00:22:52.828 but also the fusiform face area,  
NOTE Confidence: 0.850213565789474  
00:22:52.830 --> 00:22:54.490 which is of course very.  
NOTE Confidence: 0.850213565789474  
00:22:54.490 --> 00:22:57.970 Interesting in this context.  
NOTE Confidence: 0.850213565789474  
00:22:57.970 --> 00:22:58.374 OK.  
NOTE Confidence: 0.850213565789474  
00:22:58.374 --> 00:22:59.586 So in summary,  
NOTE Confidence: 0.850213565789474

00:22:59.586 --> 00:23:02.010 we can say that we successfully  
NOTE Confidence: 0.850213565789474

00:23:02.098 --> 00:23:04.888 merged data across different new  
NOTE Confidence: 0.850213565789474

00:23:04.888 --> 00:23:07.678 imaging modalities to characterize a  
NOTE Confidence: 0.850213565789474

00:23:07.764 --> 00:23:10.839 multimodal neural phenotype of autism.  
NOTE Confidence: 0.850213565789474

00:23:10.840 --> 00:23:13.320 Multimodal aspects related to the  
NOTE Confidence: 0.850213565789474

00:23:13.320 --> 00:23:15.800 fusiform gyrus and phase processing  
NOTE Confidence: 0.850213565789474

00:23:15.874 --> 00:23:18.424 are related to different behavioral  
NOTE Confidence: 0.850213565789474

00:23:18.424 --> 00:23:20.974 phenotypes and can explain variants  
NOTE Confidence: 0.850213565789474

00:23:21.053 --> 00:23:23.568 and social functioning and phrase  
NOTE Confidence: 0.850213565789474

00:23:23.568 --> 00:23:25.077 processing and autism.  
NOTE Confidence: 0.850213565789474

00:23:25.080 --> 00:23:27.366 We can also say that multimodal  
NOTE Confidence: 0.850213565789474

00:23:27.366 --> 00:23:29.446 approaches are useful in general  
NOTE Confidence: 0.850213565789474

00:23:29.446 --> 00:23:31.861 because theoretically they should bring  
NOTE Confidence: 0.850213565789474

00:23:31.861 --> 00:23:34.480 us closer to biological validity.  
NOTE Confidence: 0.850213565789474

00:23:34.480 --> 00:23:37.440 As we know that they said the changes  
NOTE Confidence: 0.850213565789474

00:23:37.440 --> 00:23:40.399 occur across different biological systems,

NOTE Confidence: 0.850213565789474  
00:23:40.400 --> 00:23:42.080 it should also increase our signal  
NOTE Confidence: 0.850213565789474  
00:23:42.080 --> 00:23:42.920 to noise ratio,  
NOTE Confidence: 0.850213565789474  
00:23:42.920 --> 00:23:45.265 so we might be more sensitive to  
NOTE Confidence: 0.850213565789474  
00:23:45.265 --> 00:23:48.532 detect effects as we saw earlier  
NOTE Confidence: 0.850213565789474  
00:23:48.532 --> 00:23:49.860 in josephina's talk.  
NOTE Confidence: 0.850213565789474  
00:23:49.860 --> 00:23:52.783 I think she also showed that the the  
NOTE Confidence: 0.850213565789474  
00:23:52.783 --> 00:23:54.412 multimodal feature classification.  
NOTE Confidence: 0.850213565789474  
00:23:54.412 --> 00:23:57.670 Outperformed the unimodal one if I  
NOTE Confidence: 0.850213565789474  
00:23:57.746 --> 00:24:00.310 remember correctly. So this is one example.  
NOTE Confidence: 0.850213565789474  
00:24:00.310 --> 00:24:03.374 But then here we could also compare the  
NOTE Confidence: 0.850213565789474  
00:24:03.374 --> 00:24:06.169 unimodal with the multimodal analysis to,  
NOTE Confidence: 0.850213565789474  
00:24:06.170 --> 00:24:08.468 it's like Randy said, to quantify,  
NOTE Confidence: 0.850213565789474  
00:24:08.470 --> 00:24:11.730 quantify actually the added value  
NOTE Confidence: 0.850213565789474  
00:24:11.730 --> 00:24:14.990 of doing these multimodal analysis.  
NOTE Confidence: 0.850213565789474  
00:24:14.990 --> 00:24:16.870 Because theoretically, you know,  
NOTE Confidence: 0.850213565789474

00:24:16.870 --> 00:24:19.501 unimodal ones are easier, faster,  
NOTE Confidence: 0.850213565789474

00:24:19.501 --> 00:24:23.256 like might be more economic.  
NOTE Confidence: 0.850213565789474

00:24:23.260 --> 00:24:23.842 But still,  
NOTE Confidence: 0.850213565789474

00:24:23.842 --> 00:24:25.297 usually we collect all these  
NOTE Confidence: 0.850213565789474

00:24:25.297 --> 00:24:25.879 imaging modalities,  
NOTE Confidence: 0.850213565789474

00:24:25.880 --> 00:24:27.818 so if we have the possibility,  
NOTE Confidence: 0.850213565789474

00:24:27.820 --> 00:24:29.416 we should aim for doing this,  
NOTE Confidence: 0.850213565789474

00:24:29.420 --> 00:24:31.620 especially in our big data.  
NOTE Confidence: 0.850213565789474

00:24:31.620 --> 00:24:34.330 Error and eventually this should  
NOTE Confidence: 0.850213565789474

00:24:34.330 --> 00:24:37.210 help us to better characterize  
NOTE Confidence: 0.850213565789474

00:24:37.210 --> 00:24:40.335 the neurobiology of autism or  
NOTE Confidence: 0.850213565789474

00:24:40.335 --> 00:24:42.210 any other neurodevelopmental  
NOTE Confidence: 0.93775259

00:24:42.298 --> 00:24:46.230 condition. And yeah, so. Go merch.  
NOTE Confidence: 0.884581138333333

00:24:53.590 --> 00:24:55.338 And they would like to thank, of course,  
NOTE Confidence: 0.884581138333333

00:24:55.338 --> 00:24:57.222 everyone who contributed to this work  
NOTE Confidence: 0.884581138333333

00:24:57.222 --> 00:24:59.220 from University of Zurich and donors and

NOTE Confidence: 0.884581138333333  
00:24:59.220 --> 00:25:01.040 the UIMS consortium and thank you guys.  
NOTE Confidence: 0.37317231  
00:25:03.460 --> 00:25:04.180 Last question.  
NOTE Confidence: 0.881328632  
00:25:06.590 --> 00:25:09.340 So this is really cool.  
NOTE Confidence: 0.881328632  
00:25:09.340 --> 00:25:10.444 This is important.  
NOTE Confidence: 0.881328632  
00:25:10.444 --> 00:25:14.290 I wonder if this approach allows you to.  
NOTE Confidence: 0.881328632  
00:25:14.290 --> 00:25:16.960 Gaining insights into like mechanistically  
NOTE Confidence: 0.881328632  
00:25:16.960 --> 00:25:20.290 being put allergies or if you see it more  
NOTE Confidence: 0.881328632  
00:25:20.290 --> 00:25:24.589 as a as a kind of these are combined.  
NOTE Confidence: 0.881328632  
00:25:24.590 --> 00:25:27.080 Get better. No.  
NOTE Confidence: 0.884369384  
00:25:29.210 --> 00:25:30.715 Yeah. So the question is  
NOTE Confidence: 0.884369384  
00:25:30.715 --> 00:25:32.220 what it's most useful for,  
NOTE Confidence: 0.884369384  
00:25:32.220 --> 00:25:34.341 more like for a mechanistic insights or  
NOTE Confidence: 0.884369384  
00:25:34.341 --> 00:25:36.389 more for increasing our predictive power.  
NOTE Confidence: 0.884369384  
00:25:36.390 --> 00:25:40.208 I'd say both. So definitely you  
NOTE Confidence: 0.884369384  
00:25:40.208 --> 00:25:41.804 know when you do unimodal analysis.  
NOTE Confidence: 0.884369384

00:25:41.810 --> 00:25:43.147 It can be useful of course too,  
NOTE Confidence: 0.884369384

00:25:43.150 --> 00:25:45.850 and you get like more the salient  
NOTE Confidence: 0.884369384

00:25:45.850 --> 00:25:48.910 features of the one imaging modality.  
NOTE Confidence: 0.884369384

00:25:48.910 --> 00:25:50.933 But you know, it could be completely  
NOTE Confidence: 0.884369384

00:25:50.933 --> 00:25:52.629 different systems involved when you look at,  
NOTE Confidence: 0.884369384

00:25:52.630 --> 00:25:55.066 you know, the different ones that you  
NOTE Confidence: 0.884369384

00:25:55.066 --> 00:25:57.785 would not detect when you look at one and.  
NOTE Confidence: 0.884369384

00:25:57.790 --> 00:26:00.802 More like you know that they  
NOTE Confidence: 0.884369384

00:26:00.802 --> 00:26:02.784 interact in combination when it  
NOTE Confidence: 0.884369384

00:26:02.784 --> 00:26:03.969 comes to the different disorders.  
NOTE Confidence: 0.884369384

00:26:03.970 --> 00:26:05.842 So yeah, when we don't also combine it with,  
NOTE Confidence: 0.884369384

00:26:05.850 --> 00:26:07.860 for example, some.  
NOTE Confidence: 0.884369384

00:26:07.860 --> 00:26:08.540 Genetic analysis,  
NOTE Confidence: 0.884369384

00:26:08.540 --> 00:26:10.920 you could do like gene expression decoding,  
NOTE Confidence: 0.884369384

00:26:10.920 --> 00:26:13.056 you know in these regions that  
NOTE Confidence: 0.884369384

00:26:13.056 --> 00:26:14.480 are cross modally implicated,

NOTE Confidence: 0.884369384

00:26:14.480 --> 00:26:16.688 we could get some more mechanistic

NOTE Confidence: 0.884369384

00:26:16.688 --> 00:26:19.396 insights and then as we saw earlier it

NOTE Confidence: 0.884369384

00:26:19.396 --> 00:26:22.572 can also increase our predictive power.

NOTE Confidence: 0.884369384

00:26:22.572 --> 00:26:23.868 So yeah.

NOTE Confidence: 0.704056788333333

00:26:26.680 --> 00:26:28.174 Very interesting analysis,

NOTE Confidence: 0.704056788333333

00:26:28.174 --> 00:26:29.668 very interesting results.

NOTE Confidence: 0.704056788333333

00:26:29.670 --> 00:26:30.852 Can you help me get the

NOTE Confidence: 0.704056788333333

00:26:30.852 --> 00:26:31.640 head around one thing?

NOTE Confidence: 0.62454568625

00:26:34.380 --> 00:26:39.420 In the linked ICA the component that's only.

NOTE Confidence: 0.62454568625

00:26:39.420 --> 00:26:43.335 Hmm. Then still influenced

NOTE Confidence: 0.62454568625

00:26:43.335 --> 00:26:45.635 by the other modality.

NOTE Confidence: 0.62454568625

00:26:45.640 --> 00:26:46.960 Yeah, that's a good question.

NOTE Confidence: 0.62454568625

00:26:46.960 --> 00:26:48.616 So you could compare compare it

NOTE Confidence: 0.62454568625

00:26:48.616 --> 00:26:50.455 with like unimodal ICA to see if

NOTE Confidence: 0.62454568625

00:26:50.455 --> 00:26:51.817 you get them the same pattern.

NOTE Confidence: 0.62454568625

00:26:51.820 --> 00:26:55.100 But that's the way that linked ICA works.  
NOTE Confidence: 0.62454568625

00:26:55.100 --> 00:26:57.800 It has its uses like this  
NOTE Confidence: 0.62454568625

00:26:57.800 --> 00:26:59.600 Bayesian model order selection,  
NOTE Confidence: 0.62454568625

00:26:59.600 --> 00:27:03.844 so it has like these are ARD prior, so like.  
NOTE Confidence: 0.62454568625

00:27:03.844 --> 00:27:05.920 Automatic relevance detection.  
NOTE Confidence: 0.62454568625

00:27:05.920 --> 00:27:09.056 So it actually gives each modality away.  
NOTE Confidence: 0.62454568625

00:27:09.060 --> 00:27:10.026 Weighting, weighting,  
NOTE Confidence: 0.62454568625

00:27:10.026 --> 00:27:13.407 and then can eliminate modalities that are  
NOTE Confidence: 0.62454568625

00:27:13.407 --> 00:27:16.460 not informative for that one component.  
NOTE Confidence: 0.62454568625

00:27:16.460 --> 00:27:18.410 So it can also identify,  
NOTE Confidence: 0.62454568625

00:27:18.410 --> 00:27:21.830 you know, structured, structured,  
NOTE Confidence: 0.62454568625

00:27:21.830 --> 00:27:24.395 single modality signals.  
NOTE Confidence: 0.62454568625

00:27:24.400 --> 00:27:26.496 If there are also the same ones that  
NOTE Confidence: 0.62454568625

00:27:26.496 --> 00:27:28.695 would come up if you do single modality,  
NOTE Confidence: 0.62454568625

00:27:28.700 --> 00:27:32.966 I say. We can check would that be?  
NOTE Confidence: 0.642544558

00:27:36.650 --> 00:27:39.412 You separate out everything from signal

NOTE Confidence: 0.642544558

00:27:39.412 --> 00:27:42.506 that also relates to the resting state

NOTE Confidence: 0.642544558

00:27:42.510 --> 00:27:45.310 and this is like what's left over there.

NOTE Confidence: 0.642544558

00:27:45.310 --> 00:27:47.137 So this one would be a unimodal

NOTE Confidence: 0.642544558

00:27:47.137 --> 00:27:49.220 component and I mean then it's not

NOTE Confidence: 0.642544558

00:27:49.220 --> 00:27:50.765 driven by the other modalities.

NOTE Confidence: 0.642544558

00:27:50.770 --> 00:27:53.137 So that's then it can also be for example

NOTE Confidence: 0.642544558

00:27:53.137 --> 00:27:55.430 noise associated with this one component.

NOTE Confidence: 0.642544558

00:27:55.430 --> 00:27:57.790 You know you can check is it related

NOTE Confidence: 0.642544558

00:27:57.790 --> 00:27:59.754 to head motion or other confounds.

NOTE Confidence: 0.642544558

00:27:59.754 --> 00:28:02.218 So it can get these single modality

NOTE Confidence: 0.642544558

00:28:02.218 --> 00:28:03.955 structured signal or noise components

NOTE Confidence: 0.642544558

00:28:03.955 --> 00:28:05.935 but then unrelated to the other.

NOTE Confidence: 0.642544558

00:28:05.940 --> 00:28:07.930 Modalities. Yeah.

NOTE Confidence: 0.566672449166667

00:28:13.980 --> 00:28:15.846 For study, you showed the different

NOTE Confidence: 0.566672449166667

00:28:15.846 --> 00:28:17.680 aspects of the present from giant

NOTE Confidence: 0.566672449166667

00:28:17.680 --> 00:28:21.310 technological data related to this one  
NOTE Confidence: 0.566672449166667

00:28:21.310 --> 00:28:24.280 component that wasn't system mean.  
NOTE Confidence: 0.566672449166667

00:28:24.280 --> 00:28:26.913 That's what I was trying to figure  
NOTE Confidence: 0.566672449166667

00:28:26.913 --> 00:28:29.378 out with these last slides.  
NOTE Confidence: 0.566672449166667

00:28:29.380 --> 00:28:30.154 It's complicated, yeah,  
NOTE Confidence: 0.566672449166667

00:28:30.154 --> 00:28:31.960 but it's like the regions that are  
NOTE Confidence: 0.566672449166667

00:28:32.006 --> 00:28:33.740 cross modally implicated and then you  
NOTE Confidence: 0.566672449166667

00:28:33.740 --> 00:28:35.300 can like characterize these further.  
NOTE Confidence: 0.566672449166667

00:28:35.300 --> 00:28:37.812 You know, do they more overlap with like  
NOTE Confidence: 0.566672449166667

00:28:37.812 --> 00:28:40.438 the face from face area or you know,  
NOTE Confidence: 0.566672449166667

00:28:40.440 --> 00:28:42.407 do we see more like object place  
NOTE Confidence: 0.566672449166667

00:28:42.407 --> 00:28:44.351 related regions and like which could  
NOTE Confidence: 0.566672449166667

00:28:44.351 --> 00:28:45.735 indicate that autistic individuals  
NOTE Confidence: 0.566672449166667

00:28:45.735 --> 00:28:47.778 have like an atypical strategy even  
NOTE Confidence: 0.566672449166667

00:28:47.778 --> 00:28:49.976 processing phases or is it more the  
NOTE Confidence: 0.566672449166667

00:28:49.980 --> 00:28:51.318 left versus the right, you know,

NOTE Confidence: 0.566672449166667

00:28:51.320 --> 00:28:53.976 we would expect more right to the.

NOTE Confidence: 0.566672449166667

00:28:53.976 --> 00:28:56.364 Involves more to the opposite hemisphere,

NOTE Confidence: 0.566672449166667

00:28:56.370 --> 00:28:58.309 so you can make sense of these

NOTE Confidence: 0.566672449166667

00:28:58.309 --> 00:28:58.863 different patches,

NOTE Confidence: 0.566672449166667

00:28:58.870 --> 00:29:01.096 but like individually by modality then.

NOTE Confidence: 0.6740534

00:29:05.000 --> 00:29:08.662 Or only through? Thank you. Yes well

NOTE Confidence: 0.6740534

00:29:08.662 --> 00:29:11.110 here it's this connect topic maps only.

NOTE Confidence: 0.8884375

00:29:13.400 --> 00:29:13.880 Yeah.

NOTE Confidence: 0.83269405

00:29:16.540 --> 00:29:16.970 OK.

NOTE Confidence: 0.9000014

00:29:19.840 --> 00:29:20.210 OK.