U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

INTERAGENCY AUTISM COORDINATING COMMITTEE

FULL COMMITTEE MEETING

TUESDAY, JANUARY 14, 2014

The Interagency Autism Coordinating Committee (IACC) convened in Bethesda, Maryland, at the National Institutes of Health (NIH), 31 Center Drive, Building 31, C Wing, Sixth Floor, Conference Room 6, from 9:02 a.m. until 5:04 p.m., Thomas Insel, M.D., *Chair,* presiding.

PARTICIPANTS:

THOMAS INSEL, M.D., *Chair*, IACC, National Institute of Mental Health (NIMH)

SUSAN DANIELS, Ph.D., *Executive Secretary*, IACC, Office of Autism Research Coordination (OARC), (NIMH)

IDIL ABDULL, Somali American Autism Foundation

JAMES BALL, Ed.D., BCBA-D, JB Autism Consulting and Autism Society of America

ANSHU BATRA, M.D., Our Special Kids

LINDA BIRNBAUM, Ph.D., National Institute of Environmental Health Sciences (NIEHS)

COLEEN BOYLE, Ph.D., U.S. Centers for Disease Control and Prevention (CDC)

JOSIE BRIGGS, National Center for Complementary and Alternative Medicine (NCCAM)

NOAH BRITTON, M.A., Bunker Hill Community College

SALLY BURTON-HOYLE, Ed.D., Eastern Michigan University

MATTHEW CAREY, Ph.D., Left Brain Right Brain

PARTICIPANTS (continued):

JUDITH COOPER, Ph.D., National Institute on Deafness and Other Communication Disorders (NIDCD) (representing Jim Battey)

JOSÉ CORDERO, M.D., M.P.H., University of Puerto Rico

JAN CRANDY, Nevada State Autism Treatment Assistance Program

GERALDINE DAWSON, Ph.D., Duke University

TIFFANY FARCHIONE, M.D., U.S. Food and Drug Administration (FDA)

ALAN GUTTMACHER, M.D., Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

DONNA KIMBARK, Ph.D., U.S. Department of Defense (DoD) (attended by phone)

WALTER KOROSHETZ, M.D., National Institute of Neurological Disorders and Stroke (NINDS)

DAVID MANDELL, Sc.D., University of Pennsylvania (attended by phone)

SHANTEL MEEK, M.S., Administration for Children and Families (ACF) (representing Linda Smith)

JOHN O'BRIEN, M.A., Centers for Medicare & Medicaid Services (CMS)

LYN REDWOOD, R.N., M.S.N., Coalition for SafeMinds

SCOTT ROBERTSON, M.H.C.I., Autistic Self Advocacy Network (ASAN)

JOHN ROBISON, College of William and Mary

ALISON SINGER, M.B.A., Autism Science Foundation (ASF)

LARRY WEXLER, Ph.D., U.S. Department of Education (ED) (representing Michael Yudin)

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PROCEEDINGS:

Dr. Thomas Insel: Good morning, everybody, and welcome to another meeting of the full Interagency Autism Coordinating Committee. Happy New Year to everyone. It's great to see so many people around the table, and I'll take a moment here to also welcome those people who are joining us by webcast or by phone.

Let's take just a moment for those who are on the phone to know who's here, and there are some people also from the Committee who will be calling in. So I'll start to my left.

Dr. Alan Guttmacher: I'm Alan Guttmacher, the Director of the Eunice Kennedy Shriver National Institute of Child Health and Human Development here at NIH.

Dr. Linda Birnbaum: I'm Linda Birnbaum. I'm Director of the National Institute of Environmental Health Sciences here at NIH.

Dr. Sally Burton-Hoyle: My name is Sally Burton-Hoyle, and I'm from Eastern Michigan University Autism Collaborative Center. And I'm Director of the College Supports Program for Individuals on Spectrum in College.

Dr. Larry Wexler: Larry Wexler, U.S. Department of Education, Office of Special Education Programs. I direct the IDEA Discretionary Program.

Mr. John Robison: I'm John Elder Robison. I'm Neurodiversity Scholar from the College of William and Mary.

Dr. José Cordero: Buenos días. Good morning. José Cordero, University of Puerto Rico.

Dr. Anshu Batra: Good morning. Anshu Batra. I'm a parent and a developmental pediatrician.

Ms. Lyn Redwood: Hi. Lyn Redwood, Coalition for SafeMinds.

Mr. Noah Britton: Hi. I'm Noah Britton. I'm a very handsome man.

[Laughter]

Dr. Tiffany Farchione: Hi. Tiffany Farchione. I'm from the Division of Psychiatry Products at the FDA.

Mr. Scott Robertson: I'm Scott Michael Robertson. I'm an autistic adult and a cofounder of the Autistic Self-Advocacy Network, ASAN.

Dr. James Ball: Jim Ball and I'm with the Autism Society.

Ms. Jan Crandy: Jan Crandy, and I'm with the

Nevada Commission on Autism Spectrum Disorders, and I also am a care manager for the Autism Treatment Assistance Program funding in our state. And I'm also a parent of a 20-year-old with autism. Thank you.

Dr. Judith Cooper: Good morning. I'm Judith Cooper. I'm the Deputy Director of the National Institute on Deafness and other Communication Disorders, representing Jim Battey, the Director.

Ms. Allison Singer: I'm Alison Singer. I'm the President of the Autism Science Foundation. I have a 16-year-old daughter with autism and also an older brother with autism.

Dr. Coleen Boyle: Good morning. I'm Coleen Boyle. I am the Director for the National Center on Birth Defects and Developmental Disabilities at the U.S. Centers for Disease Control and Prevention.

Dr. Matthew Carey: I'm Matt Carey, and I'm the parent of an autism child.

Dr. Walter Koroshetz: I am Walter Koroshetz. I'm the Deputy Director of the National Institute of Neurological Disorders and Stroke.

Dr. Susan Daniels: I'm Susan Daniels, and I'm Acting Director of the Office of Autism Research Coordination at NIMH.

Dr. Insel: And IACC members joining by phone, anyone?

Dr. Donna Kimbark: This is Donna Kimbark. Can you hear me?

Dr. Insel: That sounded like Donna Kimbark?

Dr. Kimbark: Yes.

Dr. Insel: Okay.

Dr. Kimbark: Hi. I'm Donna Kimbark. I'm from the Department of Defense Autism Research Program.

Dr. David Mandell: Hi. This is David Mandell from the University of Pennsylvania.

Dr. Insel: Welcome to you both. Anyone else on the phone from the Committee?

[No response]

Okay, great. Well, we've got a pretty full agenda here. There'll be a chance to talk a little bit about some diagnostic issues around *DSM-5* from the Work Group. We'll hear an OARC update. We've got some science presentations for the afternoon.

We wanted to spend some time today in a kind of round robin hearing in-depth from a couple of programs but actually taking some time to hear from others as well about new initiatives or new projects that will be important for the Group.

And this morning we'll take some time to

finish up the update of the Strategic Plan. We need to vote on that and put that to bed today so it can be completed. And Susan asked me to do initially a quick science update, and I'll try to do that. It's always very frustrating because there's no way you can update all of what's happening in 20 or 30 minutes. I'll try to do that as well as I can, mostly to point out what's been happening with reference to the Strategic Plan.

And it's interesting in doing this every meeting or every other meeting. I'm always struck by the number of projects that are really critical for autism but don't have the word "autism" in them. And it's, I think, important for the Committee to realize, especially as we do sort of a portfolio analysis each year, to look at where all the money is going. Some of the most important research is research that hasn't yet been counted because it's more generic, and it deals with how the brain develops or creating new technologies or tools or even new ways of doing translational science -- all of which is transformative for this field, but wouldn't be counted perhaps yet.

So let me give you a sense of some of those things as well as I think some of the science that

fits into discussions we've had about new trends in the Plan, and some of this will come up again with updates.

Oh, Susan is reminding me that before we do this, we have to vote on the minutes. Thank you. And so, before we do the update, we'll do the -- return to last time.

And the minutes, these are from the December 13th meeting, which you should have in your package. This was the phone meeting where we talked about --

Dr. Daniels: Yes, the short phone meeting --

Dr. Insel: The update. Go ahead.

Dr. Daniels: So is my mic working? Yes. So does anyone have any comments on the minutes, any corrections that need to be made before we can finalize this set of minutes? Lyn, do you have a comment? Your mic is on.

Ms. Redwood: Sorry, but I do have a comment, but it doesn't relate to these minutes. The minutes from the July meeting, those are not up on the web-site, and I don't think we -- I don't remember seeing those or approving those.

Dr. Daniels: We will be sending those out to you by email to look at.

Ms. Redwood: Okay.

Dr. Daniels: If you have any specific comments that you want to make sure that are included in those, you can send them to me by email, and we'll make sure they're in ahead of time before we send them out to you. Any comments on this set of minutes?

[No response]

Dr. Daniels: All in favor?

[Show of hands]

Dr. Daniels: Any not approving of these minutes or abstaining?

[No response]

Dr. Daniels: Okay. The motion carries to accept these minutes as written.

Dr. Insel: Okay. What we'll do is just march through these very quickly by each of the questions of interest. So from the Plan: "When should I be concerned?" Deb Fein and her group took a quick look at the difference in recognition of the autistic symptoms by parents depending on whether there was an older sib or not. And it's not too surprising that for first-time parents, that happens around 16 months, whereas for those who have a child already with a diagnosis, it's down to

somewhere around 10 months in terms of mean identification. So it points out the need for broader and awareness.

A set of projects that have come out over the last year have begun to really capitalize on the longitudinal developmental studies of children at risk. This has been going on for a while, but I think what we'll be hearing later today from Ami Klin, and what shows up elsewhere in the literature is the value of doing this. Now, you have to remember these are always looking at children who already have a high risk, about a 20-percent recurrence rate, so 1 in 5 of them will develop autism, will have a diagnosis by 36 months.

But in this piece from Lonnie Zwaigenbaum and his collaborators in Canada -- really kind of interesting that when they took this look at this group of kids every 3 months from 6 to 36 months, what they found was this development of what they call “sticky attention” really emerges around 1 year -- not present before that but shows up then and continues right along.

But probably the most significant finding in this area, which we're going to hear more about later in the day from Dr. Klin, is this recognition

that if you look at eye gaze -- that is, you use eye tracking to figure out what do babies look at when they're scanning a face, and you do this essentially every month or every 2 months across development -- what you can show is that the trajectory of development for kids who will later have a diagnosis is quite different than for those who will not. And this is looking at kids at risk.

There's 110 children in this project, so it's a pretty big project. And he'll go into this in some more detail.

There are a couple of interesting issues here, one being that at 2 months they actually are about the same. You can't distinguish between those who will go on to develop autism and those who are typically developing. But when you follow this out by 6 months, as you can see on the left -- these are just two kids. The red lines on the left under D are two examples of what you see, and the slope goes down, whereas for the typically developing kids in blue, it seem to sort of trend. It's kind of level and then trends up a little bit.

And what this is looking at on those lines is how much time is spent gazing at the eyes versus gazing at other part of the face, which is what

that picture shows you at the top.

So what does all this mean? Well, it suggests that, for one thing, there's some already difference in the developmental trajectory before 6 months of age. I think what Dr. Klin has been focused on, and I suspect he's going to talk to us about this this afternoon, is that any child who's got their attention biased in a particular way at a really critical time in development, will change the developmental process in and of itself. That is, it's like a child who's blind or a child who's deaf. The world that they are presented with becomes a different world.

And so, the question that he's exploring now is what does that mean, and what would happen to any child who is undergoing that kind of a restriction in attention in their visual world? So I'm not going to say more about this, but I think it'll be a discussion this afternoon with him when he can get into this in some more depth.

The second question about "How can I understand what is happening" -- lots going on in this area. And again, some of this has to do with technologies that are being developed in other areas that are finally being applied in ASD. This

first one is a great example of that. Andy Feinberg, who developed at Hopkins a new method for doing whole-genome methylation studies, so looking at how the genome gets tagged with proteins that make it more or less likely to express any particular gene and asking if we're looking in the brain for kids with autism post mortem, is there a difference in the pattern of methylation across the whole genome?

And there are some differences, probably not as much as many of us would've expected. He comes up with four signals that are not clearly related, but I think this is just the beginning of an opportunity to look at not sequence, but at how the genome is being regulated and how it gets expressed. So a very interesting area and lots more will come out of this.

The other major piece of this story that emerged in the last few months is this story about -- it sounds very complicated -- topoisomerases. It sounds very complicated -- topoisomerases -- but it's actually very simple. When the double helix works to create RNA in protein, it has to become sort of super coiled, and then it has to become uncoiled, and then it has to become super coiled

again. And you can think of this as like a big slinky. It gets stretched out, and it has to go back into its original slinky positions.

That's not that easy to do, and there's this group of proteins that we're just learning about called topoisomerases. We usually call them TOP1, TOP2, TOP5. And those are actually critical for that slinky process for the uncoiling and recoiling. And the result of this, what Ben Philpot and others have begun to understand, is these proteins don't seem to be functioning the way they should in some people with autism.

The result is that it's the long genes that are going to be most affected by this. The longer the gene, the more complex the protein, the more likely you'll see changes. And, in fact, as they pointed out, many of the genes that have been implicated in autism are particularly long, and so there's a whole new thought about whether this is a way to get into this problem.

And then the third area, which is getting enormous amounts of interest as well, is the way -- we've talked about this before -- the developing the disease in a dish idea. We're doing this with so many disorders in medicine. Autism turns out to

be an area of great interest, particularly syndromic forms of autism. So the SHANK3 mutations and this is the Phelan-McDermid syndrome which is associated with autism, the cells that are affected have been grown to be neurons in a dish. They show very different patterns of both connectivity and patterns of activity in the dish.

And what Ricardo Dolmetsch and his many collaborators have shown when Ricardo was at Stanford -- he's since left -- is that you can now restore some of those deficits in a dish, deficits.

So meaning that you could actually use this not only to understand the biology of the illness in vitro but even to begin to screen for new therapeutics.

So this is extremely powerful, very promising, much more to be done. And the reason that Dr. Dolmetsch left Stanford was to move to Novartis, where he has been given a very large amount of resources to push ahead with just this kind of an approach. So that's a pretty exciting change.

The other big area that has developed out of this Question 2 and is one that is very surprising, which just emerged at the end of December, so many people kind of missed this because this paper came

out over the holidays. It's a very interesting project from Elaine Chou and her many colleagues at Caltech, suggesting that there's something abnormal about the microbiome in autism.

And we've talked about this a little bit in the past, and this is one of those areas related to genomics that has really caught fire in many areas of medicine -- type 1 diabetes, asthma, certainly Crohn's disease, many areas -- the idea that the microbes in your gut may have enormous implications for many aspects of our biology, including our behavior and including the development of our behavior.

And what she has done is to look with her colleagues at the -- it's very hard to see this, I apologize, but I'll walk you through it very quickly. They've developed a model in mice of what they think is relevant to autism in which we're looking at the offspring of mothers who have an immune challenge. So it's -- they call these MIA mice.

You can see on the left the concept is that maternal immune activation during pregnancy is associated with something that they call dysbiosis. That means that the offspring have a very different

pattern of microbes in their guts. It's actually not very different. It's rather subtle.

But you can see in that heat map -- maybe you can't see it very well -- the families of microbes are significantly different between the top bar, which I think -- let's see if I can point this out, if I'm reading this right.

These are the ones that are the saline-injected moms, and these are the ones who had the maternal activation. And these are looking at all the different families of microbes from the gut of the offspring, and you can see there's really quite different -- each one of these bars going down is a different family. It's a quite different pattern. So the concept is you get this what they call dysbiosis, different families of microbes. This leads to what they call a leaky gut syndrome and getting to behavioral symptoms.

And the argument for why there may be something here and the reason this ended up in a journal like *Cell*, which is probably one of the most competitive places to publish in the biomedical literature, is that when they took and sort of normalized this pattern, by giving more of the *Bacteroides* family of microbes that were low

here, they actually repaired this and they repaired this. So it suggests that this kind of probiotic approach, at least in mice, could be intriguing.

Now, there are a lot of cautions with this. It's not necessarily an actual model of autism. It's a model of something. It's certainly a very interesting hypothesis. And I think part of what it brings us back to is the critical role of immune activation during pregnancy and what its consequences can be for the offspring.

So lots more to be done in this area, but Elaine, I think, has really opened up a field that a lot of people will want to start to look at both in humans and in other, other mouse studies.

Interestingly I think for the NIH people here, we give about six or seven early investigators awards each year to graduate students who we say you're so advanced that you don't need a postdoc, just go into those faculty. She just got one of those, so she's been identified as one of the rising stars in this field, and I think we can look forward to a lot more interesting work here.

This sort of sets up some of the issues for Question 3, which again there's a lot of directions I could've gone into here. But I just chose a group

of projects which look a lot like what I just told you about from Question 2 that are beginning to come together in some way.

So there have been several reports over the last 6 months about the importance of antibodies against -- antibodies in moms against -- fetal brain proteins and enormous interest in trying to understand what this – what this could mean for the offspring; why does this occur more in some than others? I must say at this point, it's still a relatively small number. This has been around, the story, for about 6 or 7 years.

This Brimberg paper is kind of interesting because it's the first really large-scale look at this. Almost 2,500 women were studied using the Simons Simplex Collection, and as it turns out, about 10 percent of them showed these antibodies, which you don't see very often in the control women. At least in this case they only showed up in 2.6 percent of women of childbearing age. Many questions about this. It's interesting in the Simons Simplex Collection that the 10 percent of women who had these also were more likely to have rheumatoid arthritis, or systemic lupus erythematosus, or some other autoimmune disease.

When this group from the MIND Institute that's shown in this next project took those same kinds of antibodies and injected them into Rhesus monkeys who were pregnant, and you've heard bits of this story before, the offspring showed many features of autism, of course many features of other developmental disorders as well as a sort of early test of whether this might be relevant or not.

So it's an interesting area, still a lot of questions about the specificity. Still a lot of questions about what are the targets and what is the mechanism, but certainly one that's emerging quickly, and I think is going to get more attention.

The other rather remarkable story that came out this last couple of months was from Matt State and colleagues. And I won't go into a huge amount of detail here except to say -- and this is the image from their study. What they were doing is they were looking at the nine most common genetic findings associated with autism. And they said what do these genes have in common? And they basically felt like -- based on everything we know about the regional expression and their function -- the answer was not much. It's really hard to put them

together into any sort of story.

But then they looked at a database that, again, doesn't have the word "autism" on it, but was a database of brain development and looking at patterns of gene expression across fetal and postnatal brain development in humans called BrainSpan that was built over the last couple of years.

And they said maybe we need to rethink this, because when you look at the fetal brain, which is what this top picture is here, and you compare it to the late fetal or early postnatal versus adult brain, it's like it's a different organ, completely different patterns of gene expression, different kinds of organization, different kinds of connectivity.

And maybe the question we should be asking is not how are these nine genes related in the adult brain, but do they show any kind of relationship when you go into the fetal brain and you look at whether they're in any way connected, either spatially or temporally? And that was the question that they began to investigate using this wonderful BrainSpan database.

And unbelievably -- this is like, you know,

finding out that eight of your friends actually knew each other when they were children even though they've lost touch with each other as adults -- what they found was that all of these are sitting in the same basic spatial temporal domain. In the mid-fetal forebrain, there's this remarkable connection across them showing up in some of the very same cells, which is shown down here, particularly in these projection neurons and layers five and six, so down in this part of the brain, which is being amplified here.

This is actually a really remarkable story in the sense that it's telling us that if we want to begin to understand the biology of autism through the biology of the brain, we've got to be thinking about early brain development and looking at pathways when they're first forming and developing.

So kind of a new way of thinking about this and one that's likely to, again, have a lot of power in the future, having this database now available, which is not yet published, but it's available on the web, will be, I think, extraordinarily important for the field.

Alright, Question 4: "Where are we with treatments?" This is an area where, again, a lot of

interest, and I won't spend a lot of time on this except to say that we're getting input from many, many different kinds of studies, so this is sort of a comparative effectiveness look at those kinds of interventions that can be done in a school setting.

And Sam Odom, who you've heard from here before, went through and looked across various school settings all of these different programs.

Not really much of a difference between them. The kids in every one of the programs improved significantly -- oddly boys more than girls which raises some questions. But I put this up there just to say we're at a stage where we can begin to think about these comparative-effectiveness approaches.

We're also needing to think about some of the more difficult issues that are getting additional attention, so this pediatrics paper looked at polypharmacy. Two-thirds of kids with an ASD diagnosis in this very large study were on medication, and one-third were on multiple medications for which it was felt many of those combinations were contraindicated or at least there was not a really good rationale for what they're calling polypharmacy.

So one-third with polypharmacy is about what

you see in the rest of behavioral medicine in children, but it's still nothing to be proud of. And this is a call for a more careful look at the use of medication.

We're seeing some additional work on long-term outcomes of parent-assisted approaches, and this happens to be one that is just beginning to provide some data on what is the benefit over time. I think we'll see more about that as we go along. And some of the additional things we've talked about using technology, in this case very simple kind of feedback mechanisms to help adolescents modify their behavior in a social setting -- a pilot study, just a couple of cases looked at. But this is a suggestion of the kind of thing that we may see more of.

In the Update of the Strategic Plan, we talk about the need for meta-analysis for bringing together so we can provide more clear guidance for the community. There is a Cochrane report. The Cochrane reports do this kind of thing across all of medicine. They look at areas when there have been multiple studies to put the data together to try to inform clinical care or clinical practice guidelines.

This one from 6 months ago looked at SSRIs for ASD, and I think you can see here that although there were nine studies, two things about this. The first was because all the studies used somewhat different measures, they could not do a meta-analysis, so there was a call for just what we're calling for in the Update of the Plan, some more common data elements and unified assessment measures.

But in addition, when they looked at the effect sizes in those studies that were available -- and these are different drugs in somewhat different populations -- some in children, some in adults -- the overall picture is not very promising, and they conclude that probably at this point the evidence does not support the use of SSRIs, at least for the core symptoms of autism, though they also recommend that those children who have OCD may be in a different category, and it may be useful for some of those symptoms.

One of the things that was surprising in looking through the list was how many papers are now emerging for Question 5 and Question 6. Those are areas that we had felt had been underserved.

And I'm not claiming that it's because of our

Strategic Plan, but certainly we're seeing a very rich harvest of science in these areas.

I'm not going to be able to go through all these, but just to give you a feel for some of the ones that we actually pointed to in the Plan -- the dental care. This Emily Feinberg project, which although this is a September sort of very brief description of her work on how to put -- within early intervention services very specific interventions for moms. It's called a problem-solving educational intervention. It's 6 sessions in the home, 40 minutes per session bi-weekly to give moms some skills about how to deal with an autistic child. It really has some pretty terrific impact.

And the paper that describes this -- an RCT -- is just out in the last couple of weeks, so it actually unfortunately doesn't make it into the 2013 Update because it was a 2014 paper. I guess it was out this week or maybe late last week. But this just reminds me to tell you about that. It's in a different journal. I think it's in *JAMA Pediatrics*.

But it's quite a nice example of the kind of thing that, again, we had talked about a bit in the Strategic Plan.

In the driver's seat is a kind of interesting approach and describes qualitatively the experiment being done in Massachusetts with these Children's Autism Waiver Program where low-income parents are sort of given the -- they're empowered to actually make the decisions about which services get selected and who provides them.

So the way it's done is actually pretty interesting. Massachusetts has done this in a way that other States really hopefully will take a look at. They've given a bundle of money to the parents, $25,000, and said you tell us what purchases you want to make, and we'll work with you to make sure you get them in the way you want them. So this is just looking in this initial description about what do the parents think about this.

And not surprisingly, they think it's pretty good. One of the first observations is that parents are likely to choose providers who they know, and they're much more likely to accept services, and the services are much more likely to stick because the parents have been involved in the choice. So interesting story again, still evolving. But in terms of Question 5, I thought it was adding a little bit to the kinds of conversations we've had

about how do we make this patient-centered, parent-centered, family-centered, person-centered, all of that.

[Pause]

Question 6 is the one where I wanted to take just a few minutes because we've heard from John and others around this table about this need to focus increasingly on what does the future particularly for adults. And here there have been a few reports recently that probably are worth making sure everybody is up to speed on.

First of all, we're beginning to see more emphasis on assessment, which is great and which is something that, again, is in the Update of the Plan in multiple places and does really need much more attention. And we're beginning to see the rather, I'd say, disappointing outcomes in that group of children with both autism and intellectual disability. So Joe Piven and colleagues have looked at this now and are doing this longitudinally, and so we're beginning to get a picture of that as opposed to those who have just intellectual disability itself.

I wanted to focus on a couple of stories that I found particularly worrisome. This is more work

from Paul Shattuck and his colleagues looking at what happens after secondary education. We've talked about this, and Paul has been here talking about this sort of drop-off in services and the real issue around health disparities that emerge after high school. This is a somewhat different story where he follows these people out through adulthood somewhat later. I think this is going to now several years out.

And he was doing a comparison between those with intellectual deficits, those with emotional disturbances, those with learning disability, as the comparison groups to those with ASD. And the way to read this is ASD would be 1.0 through all this, so this is looking at the odds ratio of various living arrangements in the years after high school, comparing kids with ASD to those with these other conditions.

What this means essentially is that the likelihood that a person with what he's calling mental retardation-- intellectual deficits-- living independently is 2.2 times greater than the likelihood that someone with an ASD diagnosis would live independently.

For emotional disturbances that's five times

greater; for learning disabilities, almost six times greater. And has never lived elsewhere since high school. More likely that would be true of someone with ASD than any of these three actually now, more than three times more likely for one with emotional disturbance, suggesting that the young people with ASD, as they get out of high school and move on are far more likely to remain at home with a parent or guardian, or to be in a supervised living situation, less likely to reach independence.

And if that's not convincing, I'll show you one other story that's emerging. There's a lot here, so we won't have to read the whole thing. But this is from a 10-year follow up study looking in 161 adults with ASD. It says here ages 18 to 52 years at the start of the study, so this is going 10 years out. And there'll be many reports, I think, out of this. This one simply looks at over the 10-year time point for the same kinds of issues.

And if you can just read along with me here, "Results indicated significant declines in the level of independence and engagement in vocational educational activities over the study period,

particularly for women. Greater independence in vocational activities was found for those with more independence in activities of daily living." And this is particularly worrisome: "After controlling for personal characteristics, receipt of more services was marginally related to greater improvement in vocational independence." So we have a ways to go here, and this is an issue that, I think, really will require some more attention from us as we go forward.

So a quick rundown of just some of the many, many things that have happened in the last few months. There's no way this can be comprehensive or particularly accurate. But I am struck by what a rich field this is, how many different approaches are being taken by many different groups, and the power of some of the technologies that are being developed for other applications in medicine, whether it's microbiomics or the brain-mapping efforts, the President's BRAIN Initiative. All of this will really be feeding into how we're able to approach ASD better and better as we go on.

Let me stop there. There may be other favorite projects that you want to make sure your colleagues know about that we can just bring to the table.

We've got about 5 minutes for discussion.

[Pause]

Dr. Koroshetz: I would just mention that, you know, a lot of things you showed kind of point to the fact that the technologies that are now possible to examine brain tissue have jumped, you know, another level. And so a lot of these hypotheses that people have been working on in mice can now be tested. But it really relies on the availability of tissue. And, you know, it's a sad thing to talk about, and it's a hard thing to talk about, but it seems like it's a fact that this may be, you know, if we have tissue that things could really start to fall in place.

Without tissue you're kind of fumbling a little bit in the dark trying to put the pieces together, but it's having the tissue that can really nail some of these things down.

Dr. Insel: John?

Mr. Robison: A little while ago, you cited the study that found infants who showed a preference for geometric models as opposed to faces had a higher likelihood of developing autism. So now we've heard from the Ami Klin study of decreased rate of eye contact. Have those two things been put

together or studied together to give a more powerful diagnostic picture for infants?

Dr. Insel: I don't think they've been combined exactly, but this would be a great question to ask Ami when he arrives. I don't know how much he's stuck on just faces -- you know, eyes versus mouths and faces versus objects, and whether he's done the sort of geometric patterns as a comparison. Geri, you may know more about that.

Dr. Geraldine Dawson: I don't think they've been combined, studied separately.

Dr. Insel: And the geometric pattern work, at least in its first iteration, started at about 14 months, so I don't know that anybody has gone into the first year there. But this obviously needs to be done at this point.

Dr. Birnbaum: I think there have been some new findings in the role of the environment in autism that I think are worth mentioning, especially the associations with air pollution. I think we now have quite a number of studies that are showing that heavy traffic, and the mother living in an area with very heavy traffic, so early in life again.

And I think the other point that's important

is that we're seeing associations, especially with people with certain specific genetic polymorphisms. So the real issue is going to be gene-environment interaction.

Dr. Insel: Well, thanks for adding that. Scott?

Mr. Robertson: Just to comment on the declines you see in terms of some of the outcomes among autism adults, I wonder if some of that -- the promise of that is to see research on why it's happening and any ways to mitigate that. And I'm thinking about what the role in terms of self-determination and better supports during high school to prepare individuals so when they go out into adult life, they're more ready.

And then the other aspect, too, is that doesn't necessarily speak to necessarily the quality, you know, good measures of what services, because not all services are necessarily always, you know, created equal in terms of how they provide the best supports and are the best match for mitigating the challenges that different individuals experience.

So I think the flip side of this overlying it is maybe there's a promise for research to look

into, you know, why that happens with that drop-off and, you know, what we can be doing better with how we provide services, and how we do the right supports during secondary education to, you know, try to make sure that drop-off doesn't happen.

Dr. Insel: Yes, that's a great point. I wanted to emphasize this a little bit because this has come up around the table. We've talked about it.

But I don't think we've had really good data until just in the last year to know what that transition looks like and where the crunchy points are here that are going to need the most attention. So it is worth digging a little bit into these studies, especially the longitudinal ones, to get some picture of what's happening. You know, where are these drop-off points, and where are people falling out of the system?

Anything else that has happened in the last few months that is worth bringing up? Lyn?

Ms. Redwood: No, I just wanted to comment, Tom, on the study that looked at the microbiome and the abnormalities and intestinal bacteria because it's something that we've been hearing from the parents now for over a decade that their children have leaky gut, and they respond to some dietary

changes, probiotics. So glad to see to see that study finally published in *Cell*. But I would like to see that information reflected in the Strategic Plan under the Section 4 of treatments.

And I'd sort of ask that we focus more on immune system and metabolic abnormalities and those potentials for being successful treatments and that we need to focus on those more, because I do think it's something that we could help children with now that would actually provide benefit to children that are suffering with those issues now.

Dr. Insel: Yes. So a question on that is, and I should know this, but has there been a controlled study of probiotics in children with autism?

Ms. Redwood: No, those are the types of studies we need.

[Pause]

Dr. Dawson: I'm pretty sure there was one small study in humans, and also there's been some work now going on in, I think, animal models, too, right, of autism.

I also wanted to mention, as long as I've got the microphone, and maybe these were mentioned. But I think it's really heartening to see some of the RFAs that are coming out this year that really are

focusing on some of the areas that we're talking about here.

So I think the RFA that came out from NIH to look at services-related research that one of which focuses on how to accelerate the time from early screening into early intervention. And then the second has to do with this issue of how to facilitate transition into adulthood and how to promote successful adult outcomes.

And then a third RFA that's now out that I know that is getting a lot of attention in the scientific world is from the Simons Foundation specifically focused on neuroimmune and looking at the role of both the innate immune system as well as exposure to infection and maternal immune autoantibodies and those mechanisms.

So it's just great to see some of the targeted RFAs that are coming out that really are looking at some of the areas that we know we need better answers.

Dr. Insel: Anshu?

Dr. Batra: I wanted to comment on some of the early features that, again, Ami is going to discuss further this afternoon. But also on the posture changes -- posture issues that came out really

later in the year and how that, you know, those individuals, those infants that were noted to have postural differences went on -- twice as likely to go on and have ASD diagnosed, which again I think is another important thing to look at and highlight. And it has been mentioned in our Update, but I'd like to see it highlighted a bit more, emphasized a bit more.

Dr. Insel: Yes, good point, and I'm not sure why I didn't include it here. It is featured in the Update as one of the new insights, although it's not all that new -- 1998 Phil Teitelbaum actually described exactly the same thing. But it's back in a new form. And I think like the visual tension story, and it begins to look increasingly, like, at 6 months, there is already something that tells you we're on a different track. Extremely important to know that. Noah?

Mr. Britton: I thought the science update was really interesting. And in light of the, as you said, disappointing results of the pharmacological interventions, I have to ask why is this the most used treatment. We just saw so much evidence that it's counterproductive. There are so many studies showing it's counterproductive. Why are we giving

this to children? I'm sure this echoes the feelings of a lot of people in here who may disagree with me on everything else except this,

[Laughter]

but I would love it if we could do something about this and stop making pharmacological interventions the first method of treatment, but rather turn them into the last. And thank you for adding fuel to the argument that I'm making with showing us these reports.

Dr. Insel: I'm not sure I have an answer to that. Does anybody else want to comment about that, because when you get a Cochrane report, it is often one of the things that will point to the need to change practice. But as Anshu and others can tell you who are in practice, that's often -- you've got 11 minutes if you're a pediatrician, 11 minutes per person. And that isn't a lot of time to do a lot of other things. So that's not a defense, but it's the practical reality of the way health care is done now.

Okay. Unless there are any other comments, let's go onto the next item in the agenda, which is already up on the screen. This is just to kind of get everybody up to date on where we are with the

future of this Committee and where we are in terms of this recent GAO review, which some of you should know about. It was sent out in November, but I think, Susan, you sent it out again yesterday. But I wanted to make sure we have a chance to talk a little bit about this.

So just to remind everybody, we are working with the Combating Autism Act of 2006, which was reauthorized on the very last day of September 2011. That put us back in play for 3 years. So the reauthorization was what we call dates and dollars that basically said just what we had in 2006, but let's extend it for 3 more years. And the dollars not so much, but the dates were changed to be sun-setting September 30th, 2014, meaning that we've got the clock running on the last 9 months of this Committee, unless it is reauthorized by Congress.

You've heard the responsibilities -- I think we've gone through this -- at each of the meetings, the need to do a Plan, the summary of advances to monitor activities, and then to make recommendations to the Secretary about all aspects of autism spectrum disorder with meetings at least twice a year. And those are the reports on the right, nothing particularly surprising here.

There have been sort of two interesting parallel issues that we've been facing, at least from NIH and I suspect from other people around the table. In 2012 and 2013, we've had everything from congressional hearings to some very difficult *New York Times- Wall Street Journal*-type articles suggesting that much of federally funded research cannot be replicated in industry.

And there have been questions about that, whether that's due to the fact that it's not rigorous enough or the fact that industry does studies in different ways or that simply what we've done too often is to fund laboratory A to do one thing and laboratory B to do something else and laboratory C to do something else. And so, the call has been from Members of Congress as well as from others that you must fund more and more replication of what you do so that we know that multiple laboratories are working on the same thing and getting the same results.

Now, the countervailing experience has been a report that came from the GAO at congressional request to look at whether there might be some duplication in Federal research on autism spectrum disorder. And that report, which came out in

November, which was sent to you, looks like something like this.

And even the title, "Better Data and More Coordination Needed to Help Avoid the Potential for Unnecessary Duplication in Federal Autism Activities." So this leaves Autism Speaks and Simons Foundation and Autism Science Foundation and many others off -- you know, sort of not part of the story. This is really asking within several Federal agencies that support autism research, what's going on here? Why is there so much duplication?

And these are their findings. What they describe is that 84 percent of the projects funded by the Federal agencies have the potential to be duplicative. And specifically, over a thousand of the 1,200 projects funded over this period, 2008 to 2012, were duplicative because they were in the same objectives of the IACC's Strategic Plan. Each agency funded at least one project in the same Plan objective as another agency.

For example, as they say to explain this, 5 agencies awarded roughly $15 million for 20 projects related to 1 objective, and that objective was to test methods to improve dissemination,

implementation, and sustainability of evidence-based interventions, services, and supports in diverse community settings. So the fact that NIH and CDC and HRSA and DoD and potentially the Department of Education would have funded projects in that same area was evidence that there clearly was duplication.

The other findings had to do specifically with the IACC, which they said really had just failed. Its efforts to coordinate and monitor activities were very limited. While the IACC met regularly and issued lots of reports and it has a portfolio analysis, it provided that the members of the IACC provided mixed views -- this is this last bullet -- on the usefulness of the meetings, the Strategic Plan, and the portfolio analysis in aiding coordination and monitoring.

And finally, shortcomings in the data used for the portfolio analysis limit its ability to coordinate activities and monitor autism activities. For example, the GAO found that the data used by the IACC was outdated, not tracked over time, inconsistent, and incomplete. These weaknesses limited the IACC's ability to monitor its progress on its coordination and monitoring

efforts. In addition, these weaknesses limited the ability to use these -- the Agency's ability -- to use these data to identify coordination opportunities and to avoid the potential for unnecessary duplication; hence, the duplication. John?

Mr. Robison: In the entire time I've been involved with this process, I have never once heard of IACC or any agency having the opportunity to perform an oversight role or coordinating role between Federal agencies and private funders at the time the research was being considered. All we have ever had an opportunity to do is consider the value of research once the results have been presented to us.

So while I sympathize with the GAO's criticism, I think it's worth pointing out that neither IACC nor any other any agency that I'm aware of is actually structured to fulfill the role which they say isn't being taken care of.

Dr. Insel: Yes. And just so I can clarify, they specifically were not thinking about coordination with private funders, which is a --

Mr. Robison: Even government funders, there's nobody doing that.

Dr. Insel: Yes, Scott?

Mr. Robertson: Just a couple of comments on that. One comment, some of the reason that maybe the GAO didn't understand it, some of the reasons there's duplication is because some of the objectives are broad intentionally, and so need to have multiple studies. When you look at the studies that at face value or you look at the studies in terms of the specific content, you see that they're doing different things, but they're under the same objective because they're broad intentionally so we can have -- otherwise if you get too specific, it makes it hard to fund things, right? I think we've had discussions on that before.

The other thing is I do agree with the idea that, you know, better coordination and monitoring would be wonderful in terms of at the actual, you know, research in terms of when it actually -- the nitty gritty happens in the agencies. But I think the way things are currently set up under the CAA, I'm not sure if there's space for that. I mean, I don't know if that's something in the future that changes, but I think right now things are maybe -- I'd like to say that OARC, you know, which does a lot of the work for this, does it the best it can

under the space that's given, you know, the constraints and limitations that we're working under.

Dr. Kimbark: Hi, this is Donna. Can you hear me?

Dr. Insel: Yes.

Dr. Kimbark: Hi. I just wanted -- I'm from DoD -- and I just wanted to make a comment as well about the GAO report and following up on some of the things that have already been said. I think it's important to note that the GAO report really didn't go into the words that they actually used and why they used them. For instance, they used "potential duplication," and they used "unnecessary duplication." They didn't explain as to why they used those.

The fact of the matter is that, yes, if there's a bunch of people that are funding in the same objective, yes, you have potential for duplication. But the fact of the matter is that more than one study, as has been said, has to be done in more than -- in one objective. So I think that the GAO report falls a little -- fails a little bit, I should say, in the fact that they didn't really explain what they meant by

"potential" and the vast overarching idea of how science actually works.

I also want to make out a point about the fact of the GAO saying that the IACC fails. I don't think that that's a really good conclusion either.

One of the things that, you know, the CAA doesn't actually give as much authority to actually tell Federal funders what they should fund, more or less just help to send policy recommendations to the Secretary.

And I also have to say that the tools, the advanced tools that are needed in order to track updates and all that -- and I'm talking about, you know, artificial intelligence type tools -- are not at our disposal, and nor are they actually as advanced as I think people think they are in this day and age.

So I think that there are potential pitfalls actually to the GAO report that everyone should keep in mind. And that's all I have to say.

Dr. Insel: Thank you. Allison?

Ms. Singer: So I thought the metric that they chose to use was really disappointing and really showed a lack of understanding of the goals and the strategies of the Strategic Plan. I thought in

particularly the fact that they called out the community-based services research for adults was very disappointing, because I think as a group we talked about how we need more funding in that area rather than less. And my concern is that because the CAA is coming up for reauthorization, that this report is going to be used to try to dial back the level of Federal funding that's earmarked for autism research.

So given that, the group seems to be in agreement here, perhaps the IACC should write a letter in response the way DoD has and HHS has explaining why we particularly chose to use such broad objectives and explaining why the potential for duplication is low.

I also want to point out that although there was potential for duplication in 1,200 studies, they actually found duplication by title in only 4. So I think there's a lot to respond to here, and I think we should respond.

Dr. Insel: Idil?

Ms. Abdull: I think the GAO, what they wrote is -- I want to say as someone who worked on getting reauthorized, the last CAA, it was very difficult, and there were a lot of Members in

Congress who were exactly asking the same thing before they would vote for it and said that there are a lot of parents complaining because it's duplication, there's not a coordination. And so, those are the Members of Congress who asked GAO to do this.

So I think we should respond, and we should try to explain what our goals are and why the objectives are broad, and why it is actually a good idea to duplicate research because we want to make sure are the results the same, or are we getting, you know, the most bang for our buck.

So we should respond, but then we should also keep in mind it's going to be even harder to get this year again authorized because those same Senators and people in Congress are still in power.

Dr. Mandell: Tom, this is David. Can I say something?

Dr. Insel: Please do.

Dr. Mandell: I want to echo what Alison said. I found the report in some ways, the language to be naive to the point of being disingenuous, and that some of the duplication they identified would be the equivalent of saying that two projects focused on reducing mortality in cancer would be

necessarily duplicative by virtue of the wording of the goal.

I also think it's interesting that given the very few resources that have been given to OARC to do the very large job that the GAO says belongs to the IACC, that there is no discussion of providing additional resources for these coordinating tasks so that they could be done in a more thorough way the way the GAO report described. So I would be very much in favor of responding and addressing those points directly.

Dr. Insel: To Matt?

Dr. Carey: Sure, yes. Part of what I was going to say is very much covered by what David just said. You know, I think what we -- to say whether it was, I think, one of them was over a thousand in one area. I mean, we're not going to sit down and write a thousand different objectives, right? We're not going to get into that kind of detail because we're not actually -- we don't -- that's not our role to do the RFAs and to actually create the, you know -- to solicit the research. So we would write broad goals, and there would be more than one thing in every goal, and that was kind of our intention.

But one of the things that came out of it when

I was thinking about it, read through it, and thought about it, Geri actually hit it on it with her comments just earlier, is looking really at the RFAs as they come out so we're less reactive. We are seeing stuff as it's coming out or before it actually starts and start thinking about that ahead of time. And that would be -- you know, seeing what the RFAs are and including that in kind of this process would be good.

I would say one thing -- one just detail was -- one of the questions they said there's 20 possibly replicative studies in one of the statements. I actually emailed GAO and said what are those 20 studies, and they said unfortunately we can't tell you what those. And I apologize, I really meant to follow up and ask Susan if she could find out for me what those 20 were so we could sort say are they possibly, are they actually replicative? What were those 20 studies, and just take them as an example and say, you know, does the example they gave say that there is really unnecessary duplication or is it actually just, as I think a lot of are saying, “possibly” duplicative and in the end actually just in the same category and actually valuable work.

And I think the last comment I was going to think of was actually responding to something that John said. I remember early on one time making a comment about, you know, are we really -- you know -- we have coordination in our name. Are we really a coordinating committee? And if I remember correctly, and I apologize if I get it wrong -- Susan, you made a comment back to me that we coordinate through advice kind of thing.

That's our role. I mean, you know, we're not here to -- we're not given the power by Congress to actively go in and sort of be participants in the RFA process and to do that kind of thing. And if in some ways what could come out of this is maybe Congress kind of reformulating what the role of the IACC is, that would be the way to look at this rather than, you know, is this is a failure, is this a failure in what we've been -- if they want us to do something different, then put it in the law and make it something different for whoever is sitting in this seat next time, which I hope there really is.

Dr. Insel: Geri?

Dr. Dawson: Well, it seems to me that it's very important to define what our goal was as a

coordinating body because one could say with a lack of coordination both within and across agencies that people are going in all different directions, funding many different things, and we're not really targeting our resources on what are the most important topics. So a Strategic Plan is typically to say, in a low-resource environment particularly, you have to target it on the most important issues, which is, I think, what we tried to define in the Strategic Plan.

Then what you want to see is actually multiple agencies and multiple investigators targeting particular areas. So when you put out an RFA, for example, you're saying we're going to fund 10 projects now on dissemination of services into the community because we think it's that important, or it's really important that we have both the Department of Education and NIH targeting resources around this topic because it's so important. So kind of ironically, the "duplication" factor could reflect success as opposed to failure.

So I think that's a key issue to grapple with in terms of thinking about what our role is.

Dr. Wexler: Thanks, Tom. Having been on the receiving end of I can't count the number of GAO

reports --

[Laughter]

Dr. Wexler: -- I feel our pain at times. But I do want to say, and I want to pick on what Matt said is that I think this is an opportunity, instead of the sky is falling in terms of reauthorization, to look toward how can you influence reauthorization. And I think the key to that is the word "coordinate." And, in fact, you know, because this is a public Committee, because it's bound by FACA requirements, we can't discuss investments. It would be unethical for us to discuss proposed investments in a public setting. I mean, that's just -- that can't be. It provides folks with competitive advantages in upcoming priorities that simply we're not permitted to.

So, you know, if there's going to be a coordinating function, frankly Government folks need to be able to get together and talk about the distribution of resources, that we simply cannot do in public. And that may not be popular, but we cannot do that in public.

And so, the other side to this is that, you know, certainly the nature of our grant competitions is we'll have a competition on a very

particular topic, but we'll award 5 grants, 10 grants, whatever, in that topic. Now, we don't consider that duplication because we get 5 or 10 applications that are taking different perspectives and different approaches and different methodology that are all directed at that particular research question. And so I do think GAO needs a little clarification on what duplication really is in addition to what replication is. Thank you.

Dr. Insel: José?

Dr. Cordero: I guess I won't be as polite as Larry was.

[Laughter]

Dr. Wexler: That may be a first for me.

[Laughter]

Dr. Cordero: It seems to me that sort of what -- actually these are not findings, but just interpretation and conclusions of GAO. And this assumption that they work from that only a few or perhaps one project can be funded under one objective is false, and I think that we need to state that very clearly.

And really, based on what they report, if only a handful of projects could be potentially duplicative, it really means that there is very

little evidence of duplication effort. And so I think that is really important that we write and that we clarify, especially what they may lump together as being the same project is what are -- the importance of the difference.

And just geographically, we need to have sometimes a number of studies, especially on the service side, to be able to understand what actually is impactful.

Dr. Insel: John?

Mr. Robison: I think Larry made a good point that we can't discuss actual funding proposals in an open meeting. But I wonder if we could argue that our coordination purpose might be much more effectively served if we held workshops twice a year where the IACC members could translate the objectives of the Strategic Plan for the representatives in the agencies who are going to go out and put together the RFAs.

We've never done that. That would not be a violation of our charter, and it would not conflict with the right of privacy for applicants. And I think that that would provide a very powerful coordinating influence by putting together the education defense, hold CDC people in one room and

talk about who is going to go after which perspective on which of our proposals. And I think that might be a great improvement in effectiveness for our Committee.

Dr. Insel: Just as a point of information, I've never bothered to do this, but at every one of our meetings, many of the people sitting around the room are exactly the people you're talking about. They are the program officials in the different agencies who will be writing the RFAs. So they are at all the meetings. They meet after the meetings.

They work really hard on the details of each of those objectives in the Plans. So they're -- I wouldn't think that we're working in a vacuum in that sense. They're very much here. They're just not at the table.

Mr. Robison: I guess I shouldn't have implied that they're totally missing. Of course that's right. But every time I go somewhere to a larger meeting, like IMFAR, for example, I see so many contract officers and so many people who approve grants that I've never seen before. And I just know there's a huge pool of those folks that maybe we can connect with productively, a larger number.

Dr. Insel: Okay. Idil?

Ms. Abdull: I want to wear maybe the devil's advocate for a minute, and I don't want us to seem as a Committee that we're attacking the GAO. Number one, the GAO, what they're doing is they were asked by Members of Congress, who received many emails and many phone calls from people within the autism community to not reauthorize the Combating Autism Act. And so, what they're doing is reacting to that.

And so, instead of just saying, well, you're wrong and we're right, I think we should say as a Committee -- the coordination level, what is it that we're supposed to coordinate? Define it very well, as Dr. Dawson has said.

And then in terms of the duplication, again, as someone who worked tirelessly to get this one authorized, and as you know, President Obama signed it literally the last day that it was supposed to expire because there was so many resistance. And I think we need to just explain to Congress again in our response and what have you, what does duplication mean? When you duplicate a study, sometimes I think it's good. We want to get one objective.

We want to get 10 studies done on that because

we want to make sure the efficacy and the effectiveness is good because that's what drives policy. And that's what the policymakers want to see because there were a lot of parents -- each time I contacted one of these Congress people who were going to vote yes or no, they said, you know, we've received a hundred calls for people to not approve this because there is a potential duplication. They used those words.

So we want to not so much attack the messenger, but we want to get a good message out of what our role is and why there's a duplication and why we have a few objectives, that each objective is going to have multiple projects. And that was the intention of this Committee. I think we need to be more polite, but direct.

Dr. Insel: Yes. And I also wanted to note that in -- let me see if I can go back here. The last bullet, it was actually members of the Committee themselves were -- raised questions about the value of what we do. So it wasn't just parents from outside. It was us that somehow they got the message that even members of the Committee felt that this just wasn't working, that in spite of all of these reports the coordinating and monitoring

weren't sufficient.

One of the questions that that raised for me, and I'd love some help on this, is for those of you, either private funders or in the public domain, is there an example of a group that's doing this much better, that's got the coordination and the monitoring really working well, much better than what we do for autism, because every other area I'm involved with, and there are many, I'm always -- everybody is saying we've got to do what's being done for autism. That's the example that people always point to, whether it's TBI and PTSD, or suicide, or schizophrenia, or MS.

Across the board, people want us to create these coordinating committees. We've just done one for Alzheimer's that was modeled on this. We just had a strategic plan for suicide that will be out on, I think, on Monday. It'll look very familiar. It's got the five questions and, you know, the whole aspirational goals. It's basically the same model.

So, you know, taking this to heart as you're saying that there's some real merit here, it would be helpful to know who's done this in a way that's any better than what we've tried to do and actually

gotten this to the level of coordination and monitoring that would've satisfied this group of reviewers. Anshu?

Dr. Batra: So in the community, I can just speak for myself. I can't think of an organization that's doing it as effectively as you're describing. I can just say personally as I practice as a developmental pediatrician, and in my population of families, that's what I do, which is, you know, as the developmental pediatrician I'm the captain of the team.

And the way I -- if I have a child with autism with many service providers, I have team meetings that -- where we all gather, whether it's once a year or twice a year, and go over that individual and what the plans are, the goals, and, you know, what progress has been made based on benchmarks and what do we need to do for the next 6 months.

And it's sort of what Geri was describing, but at a bigger level when you're talking about organizations. And again, it's what I found has helped me as being the captain of the team, and it's what I found has helped providers to more efficiently and effectively work in their domain to implement interventions.

And it helps ultimately the patient who we're really here to help as well as the families to really have a greater -- to have more effectiveness and optimal outcome -- but, you know, have just greater involvement, you know, for families in the process and not feel like it's someone else's role to take care of their child. So that was one comment.

And then secondly, I just wanted to, you know, just echo and concur with what Idil said. I think it's very important to take this -- this is not criticism. This is just, again, a reactionary comment, and that we have to take it, and understand where it's coming from, and then respond to it in a proactive fashion so that, you know, we can move on from this.

Dr. Insel: Yes. Part of the reason I wanted to put it on the table today was because I'm not sure I fully understand it. I mean, from my perspective, there are five or six agencies that carry most of the water in the Federal funding for science in this area. And it's never been an issue for me in thinking about the phenotype of each of those agencies and what they do.

They're very different. NIH is very different

from CDC, Department of ED, and HRSA, and DoD. I think they all have a quite different focus. DoD may be the one that sort of is more crossover, but we're talking about out of the $343 million in Federal funding, it's a very small amount that's coming from DoD. Sixty-five percent comes from NIH.

And we don't do epidemiology. We don't do a lot of the approaches to community-based services the way HRSA does. Epidemiology is CDC's lane. That's what you do. You don't do the hardcore brain-based molecular biology.

So I'm a little struck by the sense that either people on the Committee have or that anybody from outside would have -- that somehow we blurred the lanes and that Federal agencies are doing all the same thing, and that we're doing far too much.

Whatever it is, it's too much because it's all duplicative, so it should be, as you said, Alison, dialed way back. That does seem to me the implicit statement here. And to go back to Alison's comment, I mean, if people feel that's not correct, then do we need to respond to it? If as the GAO felt that they heard from the IACC that that was the case, then I'm not sure they'd need to hear from us again.

So I put in the table because I'm not clear where the Committee is coming from. I was a little stunned by the notion that the Federal agencies have these blurred rules when it seems to me that they have very clear lanes. If the question had been raised about NIH alone and said, "You know, with 65 percent of the funding coming from NIH, and you've got 5 to 6 institutes involved, how do you coordinate that?," that would've been a different question, and I think we have a very good answer for it. Or if the question had been the duplication between public and private that would be another issue which I think we'd have to grapple with and think about.

But this is -- it's an odd -- to me it was a completely surprising conclusion that somehow CDC, NIH, Department of Education, DoD and HRSA had very blurred missions and very duplicative portfolios.

Walter?

Dr. Koroshetz: Well, I mean, I think I agree with a lot of what's been said around the table, I guess. In to look forward, trying to think of how we can kind of bring a better perspective to this.

I guess, you know, one thing that happens in science is that you have -- you know, it's like

you're seeding a field and you've got to throw a lot of seeds in. They don't all germinate and grow, and some of the plants are the good ones, and some of them are not. But there's kind of a goal at the end of it. And I think maybe what we can be more clear about is indicating that what we're trying to do is to build a building which has -- that's our ultimate goal, and we have these aspirational goals, and we need bricks to, you know, make the building.

And they're going to look the same. But what we don't actually maybe do well enough is to indicate how these little -- what is the grand scheme, how these pieces, you know, are going to fit together or some of them have to get thrown away. What is the overall goal, and how do the pieces that we're funding -- how do we see them actually fitting into that overall goal?

So, I mean, maybe we have to make it clear that, you know, we have multiple studies and looking at network connections in brain and autism.

So why would you need multiple studies? Well, lots of reasons. You could enumerate them, but if we made it clear that the purpose is that we need to find out what the best technique is, find out

how it can replicate, find out what its validity is, test it in a clinical trial add the ultimate goal is a diagnostic test. So you have all these little things in the beginning that are all pushing toward the ultimate goal.

So, I think we could do that in the Plan better. I think we all have a sense of what that is for each of these questions. And we do have a little bit in the Plan. We might have to be more explicit about what is that process and what are the kind of milestones you need to hit. And that would kind of make all these little pieces seem more like a piece of a building as opposed to just individual pieces.

Dr. Insel: Alan, and then Coleen, and then we need to wrap this up.

Dr. Guttmacher: Yes. I shared, I think, a feeling of sort of surprise reading the report. And it struck me as a fundamental misunderstanding of science, that this was a good GAO report if it had been about building a highway or something where you really don't want Federal agencies, you know, being duplicative. You figure out, you're going from A to B, and you just build your one highway to get there and make it nice, and you don't waste

funds by building three extra, you know, overpasses when you don't need them or whatever kind of thing.

And that's, of course, not the way that science works particularly in an area that is complex. I mean, look at the scientific advances that Tom was presenting for the complexity of what we're trying to deal with here.

I think, you know, I like Tom's question, which had not occurred to me previously about, well, gee, if this is a flawed sort of approach, point to the group that does a better job of coordinating. And I have been thinking about it since you posed that question, and I can't think of one. I can think of some other ones I serve on where I would certainly not hold them up as a better model for this.

So I really think that, again, being thoughtful about where GAO is coming from, et cetera, et cetera, I think we can -- think we can put together a very measured response that shows that we really are working effectively. And we at the same time use it as an opportunity for self-analysis. Obviously this is -- we've not yet achieved perfection in this, but I think the basic way we're doing this has actually been quite

productive.

Dr. Boyle: I wanted to perhaps support others in thinking about a careful response to the GAO report, and thinking through how the Committee has functioned, at least in my 3 years' engagement.

Actually, I think this time around with our evaluation and synthesis of gains, I always think of us being sort of in our infancy and maybe we're moving into our early child development in terms of thinking through and advancing this science in all the different areas around the seven questions.

I actually felt like we've gotten to a better place of understanding, you know, where we are as a field, where are some of the gaps, and that really does help guide agencies. I'm not sure we had that clarity. And part of the reason we didn't have the clarity is perhaps the way we were doing it and looking at slices in time versus actually trying to do the synthesis of the whole. And I really liked the approach of the synthesis of the whole. I mean, it was more work, much more challenging.

I'm not sure we arrived at sort of the best we could've done, but I think we arrived at a good product. So I actually think the natural progression of the Committee and, you know, really

challenging ourselves in terms of trying to drive this is really important. And I think of this as perhaps an opportunity to respond, an opportunity to think about how we function as a Committee, how we can do this better, you know, how we can.

We do have a bit of blurred lines at times, and that's a natural thing because science is a progression. And as each of our Federal agencies work, you know, we do have a sense of a little bit of overlap, but that's okay, just as long as we understand that, you know, we're trying to put those pieces together, as you were saying earlier.

Dr. Insel: So we'll take some more comments, but I want to make sure that we finish in the next 5 minutes or so because we do need to decide if we're going to respond to this, and I'm hearing from most people that there's an interest in responding, how we do that, who will do that, and when we'll do that. So let's hear from Lyn and then Anshu.

Ms. Redwood: Tom, one of the things I wanted to go back to is a comment that Matt made about the report saying there were 20 studies that were potentially duplicative. I think that with the information that we have now that we received and

we've looked at the different fundings over years, which this is the first time we've ever done that, we were not tasked when we updated the Plan to answer that question, "Is there duplication?"

So I think it falls on this Committee to now go through the portfolio analysis that we have and look at those categories of funding. I know when we went through Question 2 and Question 3 there were areas in the Plan that appeared to be underfunded.

There were objectives that had never been funded. And so, instead of us saying, you know, sort of a knee-jerk response back that there's not duplication, I think we really need to look at what we have and determine if there is duplication or not.

We've not done that exercise, and I agree that you do have do have to duplicate science. That's an essential part of the process. But we really don't know with all of the studies that have been funded is there really duplication or not. So to me, we can't respond back saying there's not duplication when we haven't looked.

Dr. Insel: Anshu?

Dr. Batra: I wanted to comment. Coleen mentioned science is a progression, and again I

sort of see the similarities and development.

Development is a progression. And again, going back to what does coordination mean, what is the purpose of this Committee, you know, Interagency Autism Coordinating Committee? And again, I think of the IACC or the OARC being the team leader and the other agencies are guided by the big picture that is provided by the Committee.

And I think what John was suggesting in terms of, you know, even though we have all the wonderful people from all the different committees here, you know, at each meeting, the problem is that there's also other things on the agenda that are - - you know need to be addressed. And then there's no sort of follow-up.

And so perhaps having workshops, whether it's once or twice a year, with just the heads of the agencies that are involved and have pools of resources to fund research, to then gather and go over, well, these are the target areas based on the big picture, you know, the Strategic Plan that the IACC has provided us, and make sure that, again, there is some accountability so that there isn't, you know, unnecessary reproduction. And that way we then are holding everyone accountable, but also,

you know, we're using our resources wisely.

Dr. Insel: So just so I understand what you're saying, you're concerned that CDC and NIH would be overlapping, so CDC would start doing genomic sequencing and NIH would do epidemiology?

Dr. Batra: No, no, no, that's not what I'm saying. I'm just saying, you know, that there needs to be, some, I guess, some -- when I think about coordination -- you know, what's the purpose of our Committee here, you know -- coordination means bringing the people, again, the agencies that are involved in the funding of the research for autism, you know, that there needs to be then some follow-through with those agencies to then ensure that the resources are funding the research that has been highlighted as you know as important based on, you know, the Strategic Plan that we've outlined.

So that's the piece that I feel then is missing in this process, you know, to then allow us to have some accountability.

Dr. Insel: I'm mindful of the time because this can't go on all morning. We have lots of other stuff to do.

I think the question in front of us is do we want to respond to this report or not? I think,

Susan, HHS has responded is that right, or what's -- who has responded at this point?

Dr. Daniels: All of the agencies have been requested to make responses. There is some response that is printed in the report at the end in the appendixes, and then there are additional responses that have been required.

Dr. Insel: And can you just make sure we understand about next steps? What happens from here?

Dr. Daniels: With the Committee or with the agency?

Dr. Insel: No, with the GAO report. Is there a follow-up? Is there additional study?

Dr. Daniels: As far as I know, the agencies are required to provide a response within 60 days, and that response, I believe, is making its way through channels, at least in HHS. And I believe all the other agencies are making their responses.

And GAO will receive them, and if they have further questions, they can send out further questions to continue a dialog with the agencies until the questions have been resolved.

Dr. Insel: And Alison brought up that this is in the context of the reauthorization, so either --

I guess if there's a concern about this would lead to the dialing back of investments or to not reauthorizing. In that context, is this -- I think the question we need to answer right now is do we do want to do anything about this, or should we just leave it to the various agencies to respond?

Sally?

Dr. Burton-Hoyle: I'm going to agree with Idil I do think that we need to respond, and I think we need to take that as an opportunity to educate them about what we do and how we do it. And I think it goes back, I think, what you had said, Alan.

There's a great misunderstanding of the science of autism, and the GAO folks were probably trying to quantify what really is, and nobody is talking about, but is a great deal of anger on the part of parents and individuals with autism. So they were quantifying that by looking at, you know, what this Committee does.

So I think that that we should, as Idil had suggested, respond in a way to educate them about what the process is.

Dr. Insel: Thank you. So just again to put this in context, they feel they've heard from the Committee already, and they've already said that

based on what they heard from members of the Committee it's not working. So knowing that, is there any point in us responding further, and if so, how would we do that? What's the appropriate way to respond? Lyn?

Ms. Redwood: Tom, I have the report pulled up, and they have a list of recommendations, and there were three bullet points per recommendation. The third bullet point says for their recommendations for what should happen next is "Identify projects through its monitoring of Federal autism activities, including OARC's annual collection of data for the portfolio analysis, and the IACC's annual process to update the Strategic Plan that may result in unnecessary duplication and, thus, be candidates for consolidation or elimination, and identify potential coordination opportunities among agencies." To me, that would be what we should do to respond.

Dr. Insel: Scott and we'll come down this way, and then we'll finish up. Scott?

Mr. Robertson: Yes, and I just wanted to dovetail also with an earlier comment about the fact that some of the objectives -- you know, losing funding would be really horrible -- because

some of the objectives have never been released and funded to the extent to that extent that they should've been in the first place. And in my case, I have the biggest concerns in some way around the services in adult spheres that a lot of those objectives have not been touched much at all, and it came out in the discussions for the Update of the Plan.

And so, especially since I believe that was pointed out in the GAO study that maybe in the response it should be mentioned in there. But I think we should be highlighting maybe how we can address some of their concerns while saying that there's still a need for things to happen in a certain way than they do now. I mean, I guess we need to hit all the bases for that, I guess, in a letter, you know, directly to GAO. And I don't know how that works.

Dr. Insel: Alison?

Ms. Singer: So I think if we were to go through our list of projects that are funded and look for duplication, there would be plenty of duplication using the metric that GAO has defined which makes very little sense in this context.

I think the question that we need to address

in our response is the one that Geri brought up, which was in this -- given the strategy and the goals that we've identified, is duplication a hallmark of success or of failure? In the GAO world, duplication equals failure. Duplication equals waste. And I think what we have to point out is that that may not be the case given the goals that we have put forth.

Dr. Insel: So let me call the question. Is there anyone who thinks we shouldn't respond in some fashion? Then I hear your idea is that the response would be to follow the recommendations, but what I'm asking is, are there members of the Committee who think that we shouldn't get into this since GAO has already heard from us maybe on an individual basis? The argument could be made that it's not worth speaking up. We could just leave this to the agencies.

So can I just hear from anybody who wants to argue against responding? Linda?

Dr. Birnbaum: Not to argue against. I think we should respond. But I think there are a couple of points we should make, that duplication is not the same thing as replication, and I think what we're trying often to do is replicate findings, not

duplicate findings. And I think that has a different -- kind of different --

And one other thing is I do think we need to understand is that even if this Committee were to cease to exist, this is an authorization. And authorization and appropriation are two entirely different things. So there's no money that comes with the authorizing language.

Dr. Insel: This is a comment against responding?

Dr. Dawson: So, but I did want to say that the Committee –

[Laughter]

Dr. Dawson: -- the composition of the Committee has changed, okay, so you're not actually hearing from the same people. And I do think that it reflects an evolution of the Committee and also, I think, in the way that Coleen expressed, you know, how things have evolved since the time that the data was gathered at the time of the report. And so that may be one way to frame this is in terms of an update and a perspective from the existing Committee.

Dr. Insel: So if we are going to respond, I'd love to know who the "we" is in that sentence.

Alison, are you willing to draft something? Is that a plan? Does everybody support that idea? Alison will draft and circulate. And it sounds like there's some --

Ms. Singer: Can I reserve the right to call on other members of the Committee for help?

[Laughter]

Dr. Insel: Okay.

Dr. Daniels: The IACC doesn't have any particular time pressures about our response. They're not required to respond. But just to be clear that the IACC responding would definitely be separate from the agency responses. So the agency responses are not stating anything on behalf of the Committee and the Committee's thoughts. So this would be a great opportunity for the Committee to share their thoughts on this process and the report.

Mr. Robison: Most of the time the official response --

Court Reporter: Microphone, please.

Mr. Robison: -- and are consistent with that.

Dr. Daniels: Those responses were already due from the agencies. But it doesn't matter. The process can continue on, and I think if you feel

that it's important to respond to GAO, you should do it on your own timeframe, and, you know, that information will be something that they can consider.

Dr. Insel: Susan, let me just ask you one other thing that is of concern here. My understanding is that this investigation, which is what it was, required hundreds of hours from you and from OARC, and was one of the largest burdens of the past year or so. If we submit a response, is this going to just bring them back to the table and reengage them so that they require more and more of your time and more and more of the Office's time?

Dr. Daniels: I don't think that that's necessarily true. I think that, you know, if the Committee has a response and, you know, has a very different perspective maybe than the funding agencies individually, it would be important as a body for the group to be able to share their thoughts. So I think the group sounds like they could do that in a nice, succinct letter that could be sent off.

Mr. Wexler: Just a procedural question, Tom. Is this an independent body?

Dr. Insel: GAO?

Mr. Wexler: No.

Dr. Daniels: No. The IACC, yes. The IACC is an independent body.

Mr. Wexler: Okay. So you don't have to vet your response through the NIH --

Dr. Daniels: No. It does not have to be agreed upon by all the agencies.

Mr. Wexler: Okay.

Dr. Insel: Last comment.

Dr. Carey: I mean, two small -- one small and one kind of more general comment. The first one, when this came out, I took one of the areas they looked at and went to the portfolio analysis tool, called up a bunch of things, looked up a bunch of words that I didn't know. And basically, you know, some of it was very technical.

But, I mean, basically convinced myself that, you know, in that area I didn't see, you know -- yes, they're in the same area, but the portfolio analysis tool actually worked. I was able to go and say "Is this duplicative?," and I didn't think it actually was. I mean, there were some things that were in the same areas, and there was maybe some, you know, overlap in replication, but for the most part it was very different work, from what I could

see. And, you know, I think one of the complaints was that the portfolio analysis tool, you know, doesn't go all the way forward. You know, it doesn't go all to the present day, but there was that.

The other thing I would say is when we're talking about this, you know, in our response, you know -- Have we done our job? What are we setting out to do? -- I would put it kind of -- one thing I would put out -- this doesn't have to be in the report, but I would say my own statement on this would be, you know, are we doing what we set out to do, and what we've set out to do is to make real and substantive change in the autism community, right?

And, you know, we had a lot of discussion last year exactly on that, reviewing what we're doing and there's that. And I would actually like to see a lot more, but I don't see this metric. This metric isn't a metric that's making real and substantive change. Are here a lot of things in the same area, that's not real and substantive change.

I would love to see, you know, that we've done more, and it is my fervent hope that what we've done is laid the groundwork that's going to make

that change. I mean, this is a hard, hard topic.

It's going to take a long time. It's research. But, you know, yes, I would love to be able to say at this point, you know, when I walk out the door for the last one of these meetings, you know, later this year, boom, here's stuff we've done, not, you know, not have changed kind of the pathway that we're going on. And hopefully there'll be -- the future will be different.

And that's just my own view on it, and I would like to see more, but I realize it was hard.

Dr. Insel: So one last thought about this, and going with your comments and Larry's comments, Alison, since you're going to do a first draft, is there any value to doing this as a response from the non-Federal members of the IACC specifically, because those of us who are Federal members could be thought of as being defensive of our agency since this is essentially an attack on what we do.

I wonder if it might make sense for the public members specifically to look at this presumably more objectively to identify whether that's --

Female speaker: That's a good idea.

Mr. Robison: I think that's an excellent idea.

Ms. Singer: I can circulate a draft to all the

public members.

Dr. Insel: Alright. We have earned a brief break, and I want to emphasize brief. But there are restrooms down the hall. There's a cafeteria on the first floor. For those of you who haven't been to this building before, it's in the A wing. We're in the C wing, so you have to follow the corridor accordingly.

We need to start exactly at 11:00, so I want to make sure everybody is back by then. And for those of you on the phone, we'll hear from you again at 11:00.

(Whereupon, at 10:46 a.m., a recess was taken.)

Dr. Insel: Okay. Let's reconvene. We've got a 1-hour session in front of us to come to closure on the Strategic Plan, so if you'll take your seats.

[Pause]

Okay. Welcome back, everybody. I hope Donna and David are with us on the phone still.

Dr. Mandell: I'm here.

Dr. Insel: Great. We've got an hour to finish up the Strategic Plan, which needs to get done today. We met on December 13th by phone to talk about this, and many of you rightly said we just

hadn't had time to really look at it because it had just come. In spite of that, there were some great suggestions for revisions and for ways to modify, especially to clarify, parts of the Plan and also to identify some holes that we could fill.

Much of that was done over the course of the last month. OARC sent drafts around at various times to the co-chairs -- David, who's on the phone, to Geri who's here -- to me. Some very small additions and revisions were made to that. But this most recent version, which we're assuming is final, was intended to incorporate your comments from December 13th and anything else that they heard from the co-chairs. And so, we're at really the end of the ninth inning, and the question is, how best to proceed from here, whether you want to vote en bloc, whether there are comments that we can make about any specific parts, issues that you want us to take a look at as a Committee.

I'm going to turn this over to Susan since she's done all of the heavy lifting on this project, and let's open this up for some discussion with the idea that between now and 12:00, at least if you want lunch --

[Laughter]

-- we will have to vote on this and put this to bed.

Dr. Daniels: So we'll just take any comments that people have about the drafts that are in front of them. Noah?

Mr. Britton: I'm just wondering if we wanted to change this, is that even possible at this point? Like, would we have to do it in the next 2 hours? If we have a comment, would we then say, okay, can you change this, and then you'd have someone from OARC work on it before the end of the day, or is there a longer timeframe?

Dr. Daniels: If you need to do some edits, I would recommend trying to do them within this hour, unless we're going to push this off until April to finalize.

Mr. Britton: Okay. I was just curious.

Dr. Daniels: So if you have particular wording suggestions, I'll try to take careful notes as to what those are and make sure that the Committee agrees that are good changes.

Mr. Britton: Okay. Thank you.

[Pause]

Dr. Daniels: So thoughts, comments about the current drafts that are in front of you? We

received comments from you in the December 13th, and afterward we also got some mailed-in comments and tried to incorporate as best as we could what you were mentioning. Jan, do you have something?

Ms. Crandy: I just want to make the comment that I read thoroughly through it and feel confident, and I'd like that my changes and suggestions from the December meeting were added in there. And I think it's very reflective of what's been done, and it's a good job. Thank you.

Dr. Insel: Yes. Susan, if I comment as a contributor, I think of myself as a pretty good writer. But what I got back from what I sent in after your team edited it was so much better than what I sent in. So I really appreciate the quality of what's in here.

And I found parts of it actually really exciting and interesting. There's a lot of substance in this, much more than I think we had intended when we started. But it's been really great to see how -- with the hundreds and hundreds of papers that went into this -- the team was able to pull this together in a way that's thematic, and it reads pretty well at this point and really does give you a sense of the progress but also some of

the opportunities that need more attention.

[Pause]

Dr. Daniels: Anshu?

Dr. Batra: Susan, just some minor adjustments that I would like to comment on. Question 1 page 3, third paragraph, in the third line. I would like to suggest separating the "among infants, siblings, differences in both white matter tracks and posture have been observed in six-month-olds." And I'd like to separate that so that --

Dr. Daniels: Add a little more description?

Dr. Batra: Yeah, a little more description so it's actually emphasized a bit more.

Dr. Insel: So let me just clarify, because if we start rewriting this -- okay, because I don't want to -- I mean, I'm not willing to let this go to April so that everybody gets their inflections in.

Dr. Batra: I agree.

Dr. Insel: So if this is something the whole Committee really wants to change and we can vote on this in the next 55 minutes, terrific, and if you think it really will -- if the Committee feels it will improve. But I think all of us will syntax and slight wording changes, but that's really not the

point we're at right now. We really need to bring this to closure because it will never happen otherwise. Go ahead. I'm sorry, Anshu.

Dr. Batra: Sorry, I should've clarified. My comments are really based on just the two questions that I was involved in the various conference calls over the last few months. And the December 13th one I was not because I was out of the country, so I couldn't comment. But anyway, that would be a very simple modification, just separating those two in separate sentences.

Dr. Daniels: Mm-hmmm.

Dr. Batra: And then, in the last -- page 4, the second to last paragraph, the third sentence from the bottom, at the very end of the third sentence -- "Biomarkers such as early motor tone," and really specify motor tone and posture as well as symmetry, and add "visual attention" and "joint attention" in light of the new findings with Ami.

Thank you.

Dr. Daniels: And I'll assume that no one on the Committee had any objections to that, so as we go through, if anyone does have a concern about something that's raised, please speak up. Okay, John?

Mr. Robison: I just, I think that we didn't have the usual length of time to work on this, and I think that those of you in OARC put a lot of work into it, and I wasn't able to do my usual part of it. I feel like you've done a good job with this, and while I have no issue with Anshu's suggestion, I would like to make a move as a volunteer drafter that we accept the introductions and Section 1 and move onto Section 2 in the interest of getting through this thing before noon.

Dr. Daniels: Okay, any other comments on the introduction and Question 1?

Mr. Robison: And subject to what Anshu said.

Dr. Daniels: Okay. So I've taken note of Anshu's comments. Okay to move on and consider other sections of the Plan?

[No response]

Dr. Daniels: So other comments that others have?

[Pause]

Ms. Redwood: Are we going to go chapter by chapter, or just over --

Dr. Daniels: Not necessarily because we did do kind of a more thorough discussion of each chapter on the December 13th call. This is really to catch

those last few items that may not have come through since the December 13th call and the follow-up emails that we did. Any other items that you saw that need minor adjustments or if you saw anything that needs a correction?

Ms. Redwood: Susan, I have a question. During the phone call on Question 4, I had asked that we would include immune and metabolic issues in the discussion of treatments for associated conditions.

And, you know, I've had a short time to read through these again, but when I read through Chapter 4, I didn't see that anywhere. So do you know where that was put?

Dr. Daniels: Are there particular papers that you're referring to in terms of new treatments for metabolic and immune conditions?

Ms. Redwood: There were things discussed during the actual in-person workshop that we had. There were -- I mean, I can send papers, but I hadn't been -- I thought that the comments that we made on the phone, that they would follow-up and that the staff was including those.

Dr. Daniels: We did try to do that as much as we could. Unfortunately, I've looked at this entire document so much, I'm not sure if I can identify

for you right at the moment exactly where -- I know that immune and metabolic, if you did a search on this, it's been mentioned many, many times throughout the entire document, but --

Ms. Redwood: I just think that it's potential. It's getting to the level now where we should start looking and focusing on the potential for identifying treatments. That was my point.

Dr. Daniels: The potential for identifying treatments versus actual treatments that are in practice right now.

Dr. Insel: Lyn, I'm pretty sure that was in Chapter 4. I'm just trying to find it. It goes into -- okay. We have sleep, epilepsy, GI, ADHD.

Dr. Daniels: In Question 2, there's some mention of the metabolic and immune issues that are kind of at the basic science level.

Ms. Redwood: [Inaudible comment]

Court Reporter: Microphone.

Dr. Daniels: Right. And that study is in Question 2, I believe, because it's still at the basic science level. It's not a human trial.

Dr. Insel: What if we were to -- just to put in the immune disturbances along with the GI disturbances there? Would that suffice? Okay.

Dr. Daniels: So where is that?

Dr. Insel: So that's on page 3, second paragraph, first sentence.

Dr. Daniels: Okay.

Dr. Carey: Although, I mean, it's -- I don't know how to make it more nuanced. I mean, Carlos made some pretty strong statements about, you know, treating the neuroimmune and actually not being, you know, potentially not being a good path at this point. So I don't know if we're at that point, and to just broadly say, you know, immune. But I remember him making some statements about, you know, essentially the work that's followed on his work, and it wasn't, you know.

Ms. Redwood: [Inaudible comment]

Court Reporter: Can you use your mic, please?

Dr. Insel: So what Lyn was saying is that these are different issues. So this sentence in particular about the co-occurring. So what it says, "In addition to the research on treating core symptoms, other efforts are providing insight into managing the symptoms associated with co-occurring conditions, such as sleep, epilepsy, GI, ADHD." And the idea there would be to add “immune,” and that really sort of comes out of some of this recent

work about the connection with celiac disease, Crohn's, a whole range of issues.

Dr. Daniels: We could just add at the end there "immune and metabolic conditions."

Ms. Redwood: That would be perfect.

Dr. Daniels: And then cite a couple of those papers. Does that make sense? Okay.

Ms. Redwood: And also, you know, we've heard from a lot of families that their children have PANDAS. They have different anti-brain proteins --

Dr. Daniels: So we could cite some of that.

Ms. Redwood: -- myelin basic protein, those types of things.

Dr. Insel: And the call is really not necessarily to say that it's a problem but to explore whether the evidence is there or not, whether interventions would actually make a difference. So I think that's -- in that context it works. Anything else as we look at this for --

Ms. Crandy: I had one question. This is Jan. With the environmental triggers and toxins, at one point, didn't we list all of them that came out of that one study? There was like 10 or 20 that were included in the document. Now it seems like there's only, like, three things. Pesticides are listed in

here.

Dr. Daniels: We didn't have a full listing. What we did is we cited some of those papers that have lists, but we didn't ever have a table of exposures in the document.

Dr. Insel: So, yes. That's in Chapter 3, page 3. They go through a fairly exhaustive list of the reports over the last 3 or 4 years.

Dr. Daniels: On page 3 of Chapter 3, the middle paragraph has some exposures, and then on page 4 there are some other exposures. But at the end of that second paragraph, it says "Recent reviews about potential environmental risk factors of compiled lists of exposures of interest." And then we cite some of the papers where you can find those.

[Pause]

Dr. Koroshetz: I have one tiny suggestion. In Question 2 on page 4, paragraph two, we talked -- we mentioned DNA methylation experiments three times, a time actually this morning. I just wanted to put in one sentence just to indicate to the lay audience that DNA methylation generally reduces gene expression so they know what the --

Dr. Insel: Define it?

Dr. Koroshetz: Yes.

Dr. Birnbaum: A friendly comment, Walter. I hate to say "reduces gene expression." I think we should say "alters" or "modifies" because it really depends where it is.

Dr. Koroshetz: Yes.

Dr. Daniels: Actually in the first sentence, it says that "DNA modifications that change over time and affect gene expression." So that's kind of --

Dr. Insel: Is that sufficient, Walt?

Dr. Koroshetz: You could say --

Dr. Daniels: "Such as methylation?" "Such as methylation."

[Pause]

Other items?

Ms. Redwood: Susan, I have a question, and this comes from the public comments and the things that we hear over and over again from the public regarding vaccine research, and the fact -- I think in the public comments that we received this time from people that were on the previous calls are asking why is there not any mention of research, the need for research into vaccines into the document.

Dr. Daniels: So then, do you have a proposal of something that you think should be in the document?

Ms. Redwood: You know, in the past we've put in there that this continues to be an area that parents have concerns about, and I know that there were studies in the previous -- one of the previous iterations of the Plan that said to look at immune responses and things like that following vaccination.

And I just don't know -- you know, we really haven't gotten those studies back yet to really look at whether or not there's something that multiple vaccines are doing to the immune system or even vaccinating during pregnancy. You know, there's new research or new recommendations now out to get both flu vaccines and pertussis vaccines during pregnancy.

And, you know, there's a lot of information in the literature about what response immune stimulation can do during pregnancy if you have, say, a flu infection. We know that there's been studies that have linked that to adult onset schizophrenia and other problems. But we really don't have any long-term studies to know whether or

not exposing a pregnant mother to the immune stimulation from a vaccine could have that same type of potential neurological income.

And even the work of Paul Patterson is showing that it's not the actual infection itself that causes these neurological problems in animal models. It's the inflammatory response, and the cytokines, and the immune response that actually causes the neurological problems, not the infection.

So, you know, I think it's a scientific question that we've not really dug into as much as we should.

Dr. Daniels: So the section that is about fever metabolism and immunity is in Chapter 2, page 2.

[Pause]

So do you have something to propose in terms of an addition --

Ms. Redwood: Can I read through it and bring something back after lunch?

Dr. Daniels: We're trying to finish before lunch.

Ms. Redwood: Okay.

Dr. Insel: We've had discussions --

Ms. Redwood: Okay. Keep going and let me read through it and just see.

Dr. Daniels: Okay.

Dr. Insel: Lyn, I think just as you do that, we have had discussions as a Committee about how much we want to emphasize vaccines or even discuss vaccines in either the Plan or in any of the Updates. I think if we want to rehash that, that needs to come to a vote very quickly and determine whether the Committee as a whole really wants to support that notion.

I bring that up because in the past, the Committee has voted against it. If there's new evidence that people would change their minds for, that would be important to know.

Ms. Redwood: I'm not saying that there's new evidence, but just that it's an area that I think warrants investigation.

[Pause]

Dr. Insel: You know, again, I'm not disagreeing with you in that sense. But when we started this process, we said we weren't going to rewrite the Plan. We were going to do the accounting on the Plan. And the point of this Update was to try to summarize what is in the

literature, what's the new evidence that needs to be looked at.

So unless there is a new study that you think really needs to be cited, I'm not sure we want to open up an area that we had decided not to include previously. That does feel like beginning a revision or rewriting process.

Dr. Daniels: So, Lyn, are you saying something along the lines of further research would be desirable on the immune response, the role of infections, and vaccination during pregnancy? That sounds like what you're saying pretty much. Is that -- the question would be is that something that the rest of the Committee feels would be a useful addition to the write-up?

Dr. Koroshetz: So, yes. So on page 4 at the bottom, the progress, -- official call -- we say the role of the immune system in sculpting neural circuits, and neural inflammation response to stress needs further elucidation. It's especially important to be able to gauge the effects of maternal immune processes on the development of the fetal brain. So that, you know, is in response to this new data that this is a critical developmental stage where inflammation has a role, not only in

being -- doing bad things, but also doing good things in terms of sculpting the brain.

It talks about response to stress. We could add there that that might occur related to infections, immunizations, anything else that --

Dr. Daniels: That sounds like it would probably be a good spot to just add a couple of words to say "response to infections and immunizations during pregnancy," if that's agreeable to the Committee?

Dr. Koroshetz: Where is that?

Dr. Daniels: I think you have probably the previous versions. It's the top of page 5 for anybody who has the one that was in your packet.

Dr. Koroshetz: Oh, I'm sorry. So under "Progress Toward Aspirational Goal," that last section.

Dr. Daniels: So there's the second sentence, "The roles of the immune system in sculpting neural circuits and in neural inflammation and response to stress also need further elucidation. It is especially important to be able to gauge the effects of maternal immune processes on the developing fetal brain." So we could modify that slightly to say something about infections and

vaccinations during pregnancy.

Dr. Insel: So I'm going to push back against that. I think that unless we have some -- Walter, can you turn off your mic? I think the sentence as it reads now is open to all sorts of immune processes for any particular reason, whether it's exogenous or endogenous. And I don't think we know enough to put language in here that presupposes that there's some form of maternal immune activation that's going to have a particular role on developing the fetal brain.

It's a really important area. We just saw this with the work out of Caltech. It's also an area that many other people are going after, so one could argue it's a duplicative area. I don't think so.

But the -- I would just caution us against going too far into the specifics of what those immune processes are without really knowing anymore about it.

[Pause]

Dr. Daniels: So then, where do we stand then? How should we decide what we're going to do there?

Dr. Insel: Well, I think we put it to a vote. If people think that we need to have language in

here that specifies that potential role of vaccines in maternal immune activation, we should do it. But I think that's a question for the full Committee.

Dr. Daniels: Okay. So maybe I'll help out by putting a motion on the floor then would be to add some language specifying more about immune processes -- maternal immune processes to include infections and vaccinations during pregnancy as a possible language here.

All in favor of doing that?

[A show of hands]

Dr. Daniels: Can I see? Sorry.

Ms. Crandy: Is the goal to be driving research in that area, because you're saying there's not studies to say that, correct?

Dr. Daniels: Right. It would be saying that it's something that needs further study. So it would be to encourage research on those topics.

So all in favor of adding that language here?

[A show of hands]

Dr. Daniels: So in the sentence that says "It is especially important to be able to gauge the effects of maternal immune processes on the developing fetal brain," we could say "including the role of infections and vaccination during

pregnancy." We could add a clause there. That would probably fulfill what Lyn is describing. I'm asking how many of the Committee members present and on the phone are in favor of adding such language that would be a little bit more specific versus leaving it general.

[Pause]

All in favor of adding it?

[A show of hands]

Dr. Daniels: It would be one, two, three, four, five, six. And then against adding it?

[A show of hands]

Dr. Daniels: It would be 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13. And I didn't get anybody on the phone. On the phone?

Dr. Kimbark: Against. This is Donna.

Dr. Daniels: Okay. So that would be -- and hopefully the OARC team is helping me keep track here. And then, David, did you have a thought on that?

Dr. Mandell: I'm against adding it.

Dr. Daniels: Okay, against. So what's the total? Fifteen, okay, against. Anyone abstaining? Okay. So it looks like then the Committee does not want to add to that language and wants to leave it

a little bit more general, assuming that maternal immune processes will include all of that.

So, alright, there was another -- I think, Anshu or someone on this side had another comment? I saw a hand up, but I can't remember now.

Dr. Batra: Yes, it was me if we're done with number two. I just had a comment on the conclusion, the last page. I’m sorry, the second to the last page. I don't know what number that is -- one, two, three -- page 3 and the third bullet, research to practice. Just a statement -- well, starting at the fourth sentence, "More academic and community partnerships and new clinical trials approaches, et cetera."

Just a statement in addition to that -- statement to emphasize the need to educate and vet the community practitioners in the translation of science to practice.

[Pause]

Dr. Daniels: So can you repeat that? So you'd like to add language that say something about including --

Dr. Batra: Including the need to educate the community practitioner and vet the community practitioners on the translation of science to

practice –

[Pause]

because being a community practitioner, I think most of us are not as knowledgeable in the understanding of how the scientific research is done, and then listed and document. And we're in the role of trying to implement --

Dr. Daniels: What do you mean by "vet community practitioners?" What is that?

Dr. Batra: Well, just educate.

Dr. Daniels: Okay. So something about educating community practitioners about --

Dr. Batra: Yes. About to how take these scientific breakthroughs and then, you know, apply them into practice, because I find that that's -- myself and my colleagues -- that that's something that we're not trained to do. That's just not what we do.

Dr. Daniels: Can you help clarify that a little bit?

Dr. Insel: Yes, so a question there, Anshu, because again, this is the science plan. This is for research. So is there a way to frame that as a research problem? The way it's written now, again it's like the discussion we just had. It was meant

to be very general, including everything that will be essential for moving science into practice. And obviously that would include the dissemination, and education, and reimbursement, and all of those issues.

Yes. I mean, unless other people --

Dr. Daniels: I feel like I recall seeing part of that somewhere in here. I don't know if it was Question 5 or maybe Question 7 with the dissemination, but about --

Dr. Insel: Well, the scaling up was the other bullet that was supposed to deal with that as well. John?

Mr. Robison: I think Anshu's concern about the qualification of practitioners to translate science into practice is probably well founded. But I would be concerned that, first of all, a significant number of the practitioners would find such a statement from us presumptuous and offensive.

And secondly, I think that really it's not a matter -- it's not an autism concern. I think that in general, the National Institutes of Health might rightly suggest to the American Medical Association that there is a broad public health concern with medical practitioners getting the necessary skills

to translate scientific discoveries into practice.

I don't think she has raised an autism issue. I think she has raised a general medical practice issue, and I think the NIH would be the one to present that, not us.

Dr. Insel: Other thoughts about this change? Do we want to, again, get more specific and focus on educating providers?

Dr. Batra: I think this document is, you know, focusing on autism, and --

Mr. Robison: But aren't you afraid, though, that it speaks to every medical discipline? I mean, couldn't we say this if it was depression or cancer or stroke or anything else?

Dr. Batra: Yes, I guess. But, you know, we're here to focus on, you know, the autism – sort of -- research.

Dr. Daniels: It might fit into Question 5. We have some things about trying to translate practices across settings and so forth to say something about education of providers and practitioners or something like that.

Dr. Batra: Something like that because I think that's an important --

Dr. Daniels: If it's not there. I can't

remember.

Dr. Batra: I think that's --

Court Reporter: Microphone.

Dr. Insel: Anshu, can you use your mic?

Dr. Batra: -- that that's been the -- I'm sorry. That's been the common theme over the last year and from public comments that, you know, that there's been this wonderful science, but then how do we then apply it and use it in our everyday practice?

[Inaudible comment]

It goes back to the community, exactly. So just, again, I just thought it would be -- you know, I think it's important to just add in that that is something that we are aware of and we'd like to focus on.

Dr. Daniels: I think on the top of page 4 of Question 5, that first paragraph, if we were going to add something, maybe the -- it could be added as another sentence at the end of that paragraph and still flow into the next paragraph about educating practitioners and providers. Sorry?

Dr. Batra: Page 4?

Dr. Daniels: Page of 4 --

Dr. Insel: Chapter 4 --

Dr. Daniels: Chapter 5, page 4, top.

Mr. Robison: Tom, could you answer whether there's an NIH initiative to generally educate practitioners in the translation of science? Does something like that exist?

Dr. Insel: There's a difference between the practice -- difference between educating them about science and educating them about practice.

Mr. Robison: Translational science.

Dr. Insel: Not providers at a large scale per se. We have a whole institute called the National Center for Accelerating Translational Science, and they have created 62 centers around the country to bring in providers, and community leaders, and a whole range of people to make sure that communities involved in planning research and that discoveries were quickly brought into community settings. But we don't -- the NIH does not have an education arm per se that goes out to run CME courses or to educate the provider community.

Dr. Boyle: So Laura -- I apologize. Laura Kavanagh is not here, and HRSA does have an educational arm, and they have a fairly active initiative in that regard. I don't know if that's captured here well, but --

Dr. Insel: So again, we're not duplicating. I'm so glad to hear that. Alison?

Ms. Singer: I think there's an easy way to get to what Anshu was saying, which is in the conclusion under the bullet that says "research to practice," where it says "providing an opportunity to study the use of interventions and services in a real-world setting," if we just add "providing an opportunity to study and encourage the use of interventions -- evidence-based interventions and services in a real-world setting." Does that speak to your -- it's the bullet that says "research to practice."

Dr. Batra: [Inaudible comment]

Ms. Singer: So in the second bullet, for me on the conclusion in my draft, it's on page 3. The bullet is labeled "research to practice." And in the first -- in the third line it says "[comma] providing an opportunity to study the use of these interventions and services in a real-world setting."

And I'm asking Anshu if we added the phrase "to study and encourage the use of these interventions and services," if that speaks to --

Dr. Boyle: I was going to go a little bit

further. Maybe "incentivize the adoption of," which is how you get into practice.

Dr. Farchione: If we're adding the word "encourage," then that sort of implies that -- based on the sentence -- it implies that those things already exist, and I think what we're saying is that those things don't exist because the sentence says that there are already many practices, blah, blah, blah.

Dr. Insel: So the point -- this was one of the -- I'm not sure if the bullet is quite right. This was supposed to be about going from practice to research. The idea here was to do studies in those environments where there are lots of things going on to find out whether any of them actually had value.

So it's a bit different than the idea of taking science and then disseminating to people in the community. This was actually saying let's go from outside to inside instead of inside to outside. And that's where, I think, a lot of the action is now.

Ms. Singer: So maybe the bullet should say "practice to research."

Dr. Daniels: I think that's a typo.

Ms. Singer: Okay.

Dr. Insel: So, good. Okay. So that actually changes things a bit.

[Laughter]

Dr. Daniels: Glad you caught that typo. The words aren't misspelled, so it didn't --

Ms. Singer: Oh, sorry.

[Pause]

Dr. Daniels: So we could at the top of page 4 of Question 5 in that last sentence, "The Committee highlighted the need for the research portfolio to focus on the developing practical, affordable, and culturally competent services, and support approaches that can be used in a variety of settings, and for these approaches to be able to be adapted," -- there's a long sentence -- "to the required scale to meet community needs and the need to educate practitioners and providers in the community" or something about, you know --

[Inaudible comment]

-- not just to implement. She's talking about, like, translating new practices or new science, so something about that. But we could put that sort of phrase there if people want to do that.

Dr. Insel: I don't know. So I guess, Anshu, I

think I know where you're coming from, and let me just suggest that there's a countervailing issue here that a lot of people think that the future is about empowering families, not practitioners, that what we want to do increasingly is get the information, get the tools, get everything to the families themselves, and that they can lead the change rather than expecting pediatricians or child neurologists to do the heavy lifting there. I'm not sure that's the case, but I think if we were trying to be very future oriented, that's kind of where more of the action is. That's where the practice to research piece comes in, citizen science piece, all the issues around -- I showed you one of those examples today -- the idea that if you empower families, they can make choices that look like they may have better outcomes.

So I hear what you're asking for, and I think it's probably already in here, but if it isn't, we should make it more explicit. But I wouldn't want us -- when we talk about changing, I think the term is scaling up to be usable in the full range of community settings -- I would want that to be limited to educating providers because I think we want to think very broadly about community

settings, meaning providers, families, individuals, and even beyond -- school systems, all of that.

So again, it's the same question I had with Lyn's suggestion, whether we want to get more specific or keep this general knowing that what this is really about is sort of the accounting effort and making sure that we don't over specify in areas where we are asking for more science.

Ms. Abdull: I agree that what Anshu is saying is that if the provider -- if the pediatrician -- is not educated or doesn't understand the science or the research, then it's very difficult for the family to understand, because they are -- as a mom, people like Anshu are between you and me myself, doctor. And so, she has to understand what it is that you did in order to tell me, the mom.

But then I also understand your point in that we don't want to say we want to empower providers. The goal should be to empower parents, so maybe we can say "community," which would then a part of both the providers and the -- as well as the parents, the caregivers, the whole community as opposed to just specifically listing.

Dr. Insel: So, okay. I think I'm with you. So under this, the bullet then would be a scaling up

bullet, right, not the practice to research bullet.

And then what you're asking for is an additional sentence that just says what those community settings are, so it could actually say something about the importance of disseminating or implementing scientific findings by educating providers, empowering families, and ensuring high-quality care.

Dr. Batra: Exactly.

Ms. Abdull: Yes, right.

Dr. Insel: Okay.

Dr. Batra: So, Tom, just, you know, commenting on, you know, yeah, the ultimate goal here is to empower families. But to be honest, families come to the providers, the pediatricians and the family practitioners for guidance. And so if the pediatrician and the family practitioner do not have a clear understanding of how to interpret the scientific findings, then it's not going to get translated to empower the family.

Dr. Insel: So, again, then what's on the table is a recommendation that we add a sentence to the scaling up bullet. And I think there's a bullet missing, by the way, right after that, right? "For the population inclusion" is a separate bullet.

Dr. Daniels: Oh, the little bullet mark?

Dr. Insel: Yes. Do we need more discussion about that? Do we need to vote on it? Let me just see if there's anybody who doesn't want to do that.

[No response]

Dr. Insel: Okay. Let's move on then.

Dr. Dawson: This is a minor word change, but it does have an important, I think, connotation.

And it's on page 4 of the Introduction, and it's the top paragraph about the *DSM-5*. So in the sentence that says -- it's pertaining to "some people are concerned that they may no longer be diagnosed under the new criteria." And then there's --

Dr. Daniels: That's Question 1, I think.

Dr. Dawson: Oh, okay. Is that Question 1?

Dr. Insel: Yeah.

Dr. Dawson: Okay.

Dr. Dawson: And it says "Introduction." Oh, "Introduction to Question 1," I'm sorry. Okay, yes, Question 1. So it says, "Recent findings, however, on the whole suggest that this is not the case." If we could just change that to "this may not be the case," because there hasn't been really a lot of research on that yet.

Dr. Daniels: Um-hmmm.

[Pause]

Dr. Insel: Anything else as you scan through this? Scott?

Mr. Robertson: Am I allowed to make comments on Questions 5 and 6? One comment was on -- that I had related to Question 6 was that it mentions -- and it's really awesome, and it mentions a study on -- the survey on health care experiences of autism adults.

But it mentions it only in the context of -- that there's more emergent community-based research that has autism adults as partners and doesn't go into detail on the study. Is there any way to either reference or cite in line in the -- again later on. This is reference 10 on page, I think it was 2. Let me check with --

Yes, it's where -- it's talking about "The examples of community-based research -- participatory research have also emerged." It's that sentence that starts like that in the second paragraph on page 2 of Question 6. Is there any way to add a sentence after that to say what the study found or something later on -- that kind of integrates that citation in, because it's really,

really a major gap in the access to health care experiences and the quality-of-care experience.

But you wouldn't get that just by, you know, that sentence, because the sentence kind of just cites it in passing for the sake of the fact that it's CBPR and doesn't mention, you know, the details of what it actually found in that study.

And that's really, really -- I think a really, really important study in what its findings are in the disparities of health care that are experienced by autism adults. So can that be addressed by a possibility -- by, you know, a short sentence after it's -- where it's first cited or some words in line later on in the text that reference some of the specifics of what that study found?

Dr. Insel: Are you volunteering to give us a sentence?

Mr. Robertson: Do I need to -- do I need to give the sentence this exact minute?

[Laughter]

Dr. Insel: You have about 14 minutes.

Dr. Daniels: Can you just give a summary of what it is you want to capture, the idea?

Mr. Robertson: The specifics of what the study found I can pull up on here on my iPad in terms of

the specifics on the unmet needs. Actually you'll have to come back to me because I had it here.

Dr. Daniels: Just if you could tell us the take-home message.

Mr. Robertson: Can you come back to me in, like, one -- a second I after I find -- I need to re-pull up the study. Can I jump to the other wording that I had and come back in a second after I pull up the study?

The other thing was on Question 5, it was talking about the -- Question 5 was talking about the increases in cost estimates. Is there any way to put some wording to -- so people can understand the limitations of that, because when you see those straight dollars and not see the context of the content from the study, you think, wow, that's just a large number. But you don't get that sense from the paragraph that it's one study estimating those.

And some of those cost estimate studies have -- you know, there are some major limitations to those studies, but it's not -- that doesn't come across in that paragraph.

This is page 3 on Question 5. It's paragraph three.

Dr. Daniels: I think with most of the studies

that are cited in here, we didn't really go into the detail of explaining all the different limitations and so forth of every study. I don't know if that would be --

Mr. Robertson: Well, I worry about it more for this because it's a cost estimator study, I mean, studying, you know, billion dollar kind of costs, just the straight value without even a few words to explain kind of the backdrop of that. I don't know.

Dr. Daniels: What's the concern that you have, that it's an overestimate or that --

Mr. Robertson: Yes. In some cases, those cost estimates may be overestimates, yes.

Dr. Daniels: Because I think --

Mr. Robertson: And I have seen some research that is pointed -- I don't know off the top of my head, but I have seen some critiques of some of those cost estimates that say that they may be overestimates.

Dr. Daniels: David, are you on the phone?

Dr. Mandell: I am.

Dr. Daniels: Because this is your study, so maybe you can –

[Laughter]

Mr. Robertson: At the risk of --

Dr. Daniels: I don't know if there's something that you think could be tweaked here to try to address that concern.

Dr. Mandell: Yes, and I'm the person they're critiquing.

[Laughter]

So, Scott, it might be helpful if I understood what -- why this was a concern for you. Is it just that you want it to be as accurate as possible, or are you concerned that it leads down a path that's not good?

Mr. Robertson: No, just for the sake of accuracy. And I just worry, and maybe I'm wrong in that, but I just worry that some of those cost estimators, you know, that there is some concern that sometimes the costs may be an overshoot at times, that's all.

Dr. Mandell: You could put "approximately" as a qualifier. But I think we were pretty conservative actually in the assumptions we made.

Mr. Robertson: Okay.

Dr. Insel: Scott, can you turn off your --

Mr. Robertson: Oh, sorry.

Dr. Insel: So, again, in the spirit of what this document is supposed to do, unless there is

another paper that has another number, this cites the 2007 estimate that unless there's something within the timeframe that we're interested in here, it does say now "estimated at," so it does essentially provide the approximation.

Dr. Daniels: I guess -- is your concern that maybe people that might not be as disabled, the cost is not going to be anywhere near that for somebody who's less affected by disability through their ASD versus somebody who's severely affected?

[Background talking]

Mr. Robertson: No. It's just that the -- my concern is you would only know some of the specifics by -- but I guess maybe that's the case for a lot of this. I guess maybe there is no way to address this.

Dr. Insel: Yes. That's the problem all the way through here. I think all you can do is capture where we are currently, recognize that science is iterative.

Mr. Robertson: I did find the wording on that other study if you want --

Dr. Insel: Yes.

Mr. Robertson: -- to say quickly is that and I don't know how to put this exactly in a sentence.

But something to the effect of "higher odds of unmet health needs related to physical health, mental health, and prescription medications" is kind of the gist of what they found and lower satisfaction with patient provider communication. These are some of the major findings.

Is there any way to put that in the -- I don't know if I can give you an exact sentence on that, but I guess I can try to think up something.

Dr. Daniels: I think that's enough information.

Mr. Robertson: That's enough information for that.

Dr. Daniels: Does anyone have an objection to adding a sentence to say what the findings of that paper were?

Dr. Insel: So this is a CBPR question.

Dr. Daniels: So we could say "In this particular study, the findings showed blah, blah, blah," and then go on to the next paragraph.

Dr. Insel: Okay. We're down to the last 10 minutes. Idil?

Ms. Abdull: I just want to comment a little bit on what Scott said. In terms of the cost, I think the autism cost is going up, and so I would

even say this is an underestimated and agree with David. Maybe people who have autism that are affected in the less severe way, perhaps it seems an overshoot, but people who are affected severely, I would say this is a conservative estimate. Just a comment on that one.

And then I have a question on Chapter 4, page 5, the last paragraph and the last sentence. If it's possible to say, "Furthermore, interventions must be tailored to individuals from diverse communities in a manner that is culturally responsive, and parents need to have access to high-quality sources of information about available interventions."

So if it's possible just to add "in a manner that is culturally responsive," because just to say "diverse" could mean lots of things.

Dr. Daniels: Where are you again?

Ms. Abdull: Chapter 4, page 5, the last paragraph, the last sentence that starts with "Furthermore, interventions must be tailored to individuals from diverse communities in a manner that is culturally responsive."

Dr. Daniels: Does anyone have any concerns about adding that phrase?

[No response]

Dr. Insel: Isn't the term "culturally sensitive"?

Ms. Abdull: On Chapter 5, yes, for access to services, but the actual intervention should also be "culturally responsive."

Dr. Insel: "Responsive," not "sensitive"?

Ms. Abdull: Right. It's sort of the same thing. It's just tomato/tomahto.

Dr. Insel: Anything else? Do I hear a proposal to accept with these modifications?

[Laughter]

Mr. Robison: I'll move.

Dr. Insel: Is there a second?

Ms. Singer: I second.

Dr. Insel: Susan, I'm going to give you the thrill of doing the vote.

Dr. Daniels: Okay. And I'm hoping my team will help me keep track of this.

All in favor of accepting the Strategic Plan Update draft with these edits -- all in favor?

[A show of hands]

Dr. Kimbark: I'm in favor on the phone.

Dr. Daniels: Okay. David, how about you?

Dr. Mandell: I'm so in favor.

[Laughter]

Dr. Daniels: So I think it was unanimous. Did I miss anybody?

[No response]

Dr. Insel: Are there any abstentions?

Dr. Daniels: Anyone against or anyone abstaining?

[No response]

Dr. Daniels: Okay. So that was unanimous then for all the people that are in the room.

[Applause]

Dr. Daniels: Great job, everyone. So then we will get these edits incorporated and the tables and so forth that you also reviewed earlier, and there were no -- I received no changes after December on those. It'll be part of a final document. It's going to take a little time to put it together with all the tables and so forth, so the final document will be hopefully released in February. We will send you a copy as soon as we get it all put together and, of course, it'll be released as our usual practice, and we'll put it up on the web. Geri?

Dr. Dawson: So on behalf of the Committee, I would like to thank Susan Daniels for the amazing

amount of work that has gone into this and really the production of an outstanding product.

[Applause]

Dr. Daniels: Thank you, and to the staff of OARC.

Mr. Robertson: Are we allowed to take an early lunch? Is that allowed?

Dr. Insel: I think you've earned it. But we do need to be back exactly at 1:00, so no one is allowed to be tardy this time. I'm going to give you 5 minutes of early release. Yes, Coleen, comment?

Dr. Boyle: Just a thought and I had this in December. Whether or not we could take this great work and put together some type of perspective piece for the *New England Journal of Medicine*, or *JAMA*, *Pediatrics*, or something like that to really actually show the progress that has been made and the context, and maybe even coming from the IACC.

So just a thought I had in December and thought -- and I still feel that.

[Pause]

Dr. Insel: Yes. Okay. Let's take that into consideration, and maybe we could even identify the issues around replication, duplication, efficiency,

all of those. That would be good.

[Laughter]

Okay. See everybody at 1:00.

(Whereupon, at 11:55 a.m., a luncheon recess was taken.)

Dr. Insel: Welcome back everyone. We need to get started on the afternoon agenda, so if you'll take your seats. We have as the next part of the agenda a public comment period, and then that's followed by a discussion of public comments. And I want to remind you as well that you've got written comments that came in your packages so that you all would have had those before the meeting as well as oral public comments in a written form, which you would've had before the meeting as well.

So unless there are any questions or other issues, we should go ahead and move into the public comment period. I have -- as the first commenter, I have John Erb. Is he here?

Dr. Daniels: I was told that he didn't check in yet, and he did write an email saying he didn't know if he was coming. So maybe we should move to the next person.

Dr. Insel: Well, you do have his written transcript of what he was planning to say in front

of you. The next on my list is Marian Dar. Please.

[Pause]

And as always, we'd like you help you to keep your comments to about 5 minutes.

Ms. Marian Dar: Hi. Good afternoon. In the interest of time, I'm here as a parent, and here is my video. Excuse me one minute. Tech, can you start at the beginning and see if it works again?

(Video presentation)

Dr. Insel: Marian, if you want to take a moment to say anything about that, we've got the time. So since you put all this work into creating the video, would you want to say anything about it?

Ms. Dar: I made the video based on our family's experiences and the lessons we've learned that I thought might be of value and help others, also the frustrations and challenges.

So this is a condensed version of what I would say. There are other areas that I think are very important that aren't here and which have been so part of our lives and so helpful like music, like outdoors, and animals, as you saw that animals are so powerful that they bring out a sixth sense in my son and other children I've seen with autism. You think of theory of mind and an inability to think

of the other, but that sort of fades. And for some reason, the animals and the bonding gets past that. So really, theory of mind and empathy is an interest and also a capability, and there's a capability that you wouldn't necessarily attribute to or expect from someone with autism.

Dr. Insel: Well, thank you very much.

Ms. Dar: It's sort of backward. I would've spoken in more -- but, yes.

Dr. Insel: Thanks for making that and sharing it with us. We'll go on to -- the final person on the list is Linda Varsou.

[Pause]

Dr. Linda Varsou: Thank you. I'm going to say in words what we saw in the video, the DVD, a while ago. And I have *The New York Times*, but I have not seen you, so there's no connection or communication between us. And for the third time, I'm bringing at the IACC the issue of chronic parental denial, which is a very serious issue having as victims the child of autism.

And now we have literature, the article from Israel bringing up the denial of the parent of the child of autism or severity at 53 percent. So we have a fast, short, low-cost research. We can find

that within 1 year. What is the prevalence in the United States? This is a must because a lot of research and data will be used based on that.

The other issue is for the first time I'm going to bring -- we have to see within the spectrum of financial crisis what to do when we have decreasing in funds for research and services and increasing of autism. Is there a solution what we can do?

So maybe I am a romantic, but I am also pragmatic and very realistic. Therefore, I think I am optimistic that we can change things, and we can survive with the best outcome only if we change our minds and how we see and we proceed with different things and issues in research, in services, in education -- everywhere.

The so-called within an autism society, which will benefit all of us, that's the only solution to go. For instance, this is a fun story about the research. This is a fun slide which I made back in 1998 when I was giving a lecture at Johns Hopkins.

I was studying neuroscience and autism at that time. And believe me, I was spending most of the time studying literature back and again and again, finding conflicting results, missing data, missing

factors. Therefore, if you are the factor, a confounding factor, that would change totally the data. And I made this funny slide because as you know in academia, you have to publish or you perish. And that is playing with the letter "P." In order to pay -- in order to publish, you have to have a P value less than 0.001, whatever. And once you have that, you publish papers, publications, promotions. You have prestige, position. You become professor, excellent profession. You have praise.

And finally you have power. So what you are saying has a weight. It counts.

I was in the first column for years until my son was diagnosed with autism. Then I said, oh, my god, it's not the science that we need to do. The problem for my son has to do -- has to go to do an experiment which all the conditions have to be united and not missing different factors, which are not difficult to do.

And then I moved to the next column, which means "P" as people. And that has to do with patients, parents, pain, pressure, prevalence, privation, and population. And the first column -- in the first column they say that we do everything for you, for the second column. But the second

column feels that we don't ever receive what the first column thinks that's for us. We feel sometimes like experimental animals or like just we bother them because the first column has to thrive, not the second. So I think both columns have to thrive within a symbiotic relationship, and I put one next to the other. Power equals to population because population has power also to change things if we want.

So for instance, everything -- every action, every decision has to do -- has to be based on the cost-benefit analysis concept. But of course, talking benefit here is not profit to make more money. It's wellness, health, privation, education, all the other things.

Dr. Insel: Okay, Dr. Varsou, we're just at 5 minutes, so we're going to give you some more --

Dr. Varsou: I'm finished. I'm finished. Yes. So in the research or in academia, there was collaboration and cooperation to be cost-effective, must replace the words "academies" with "competition" definitely. This is the request from parents which have no more time to waste in research which are ineffective and not complete because our children, they grow and we are close to

dying.

Okay. Then the coexistence of things in the symbiotic system has to do that we have to rediscover the basic values and need for all of us, for all human beings according and to rediscover the laws and the principle of nature when we hear, for example, just before about vaccination for pregnant women, I said, my god, I have to react. I cannot take that anymore because my background was immunologist, and I studied immunology, and I worked on the vaccines at the Institute of Pasteur back in the 70s. I am 65 years old.

Oh, okay. The early baby vaccination, I don't want to take any position because my life is important because of my son, you know. I cannot talk much. Just to tell you that we know definitely that the immune system and the neurological system with both are close together. They mature only around 2 and half years old. So before that age because those two systems collaborate very closely, our brain has 85 percent of neurological tissue, system.

Then when we do early vaccination, what do we do? We do the so-called immunointervention. That means that probably we do that in a system which is

not mature, not mature the immune system, not mature the neurological system. So finish that. We go to pregnancy now. And that I have to talk. I have to take -- I have to say something because we consider it like it's like a crime. We know that pregnant women have a state of immunotolerance.

Dr. Insel: So we're at 7 and 1/2 minutes, so I'm going to need you to wind it up.

Dr. Varsou: That's my last word. Immunotolerance means that they don't react to every antigen because they have to accept the antigen comes from the father. So it's not the same state of immunity. So the vaccination is not going to work in the same state.

Okay. This is my point. There are ways to save our children. Research, we need the research. We need the IACC, of course, definitely at any cost. But we need to increase and change and revise our way of thinking. Thank you.

Dr. Insel: Thank you. And let me just check whether -- so John Erb is not here, is that correct? Okay. So we've put some time aside to talk about public comments or to raise other issues.

John?

Mr. Robison: You know, seeing that video and

hearing her talk about the outdoors and horses and such, I know that we are a -- boy, don't like my horse comment there, huh? The beagle is under the porch.

[Laughter]

Anyway, so I know that we're sort of a strict scientific organization. I think that we could do our community a great service if we were to fund some research to validate the effectiveness of some of this simple, obvious stuff -- being outdoors, therapy with animals -- which we intuitively know to be beneficial to especially children such that we could get insurance reimbursement for that kind of therapy. I think that would be a major, major service to our community if we could help facilitate that through science.

[Pause]

Dr. Insel: Scott?

Mr. Robertson: I just had a comment on the second presentation on whether the -- what it's called -- the denial, whether that -- is that the first of its kind in terms of finding out numbers in terms of people that have a diagnosis related to autism? I mean, because I'm not really familiar with that kind of aspect of the literature.

Dr. Varsou: Do you want me to answer to that?

Mr. Robertson: And then the other -- yes. And the other question I had for you is the -- on that second column of people, et cetera, et cetera, does that suggest the need in some cases for more qualitative research that can inform the quantitative that interacts more with people, gets more firsthand perspectives to be driving the experiments, et cetera, like they do? I feel like sometimes more in Europe than in the --

Dr. Insel: So, Dr. Varsou, you'll have to use a microphone. But if you could just within one sentence say whether this is the first study of denial.

Dr. Varsou: We have the first serious study on denial, but there are many theories, if you like. I can give that to you --

Dr. Insel: Thank you, take it --

Dr. Varsou: -- which is very well documented. The only thing, as I said, in November is there is a bias because the families participating in this study, it was an involuntary basis. Therefore, they were not so much in denial to start with. And then they mention in this article that maybe denial is as high as 57 percent. Okay.

Dr. Insel: So this is an issue, Scott that has been given a lot more attention in other areas, not so much in autism yet. But it could emerge.

And then the question that's on the -- that Scott raises about qualitative research I think has been in the mix for some time. We've talked about that a little bit in the strategic planning process and the importance of being open to, whether it's anecdotes or qualitative data could help to inform a real quantitative, rigorous study.

Other comments? John?

Mr. Robison: Does denial -- I agree just from my experience in the field that's a big problem -- but does denial rise to a level where it is actionable like neglect? Is it something that any of us have any power over?

Dr. Varsou: I studied this issue. First of all, professionals in the United States, they tell you that according to their clients, they estimate denial around 45 percent. In Europe, in different countries, it's around 50 percent. Again, depends on the country. That's from professionals also.

Denial -- you can read the two previous summaries of my talk that I gave you -- has to do with every aspect in the child's improvement or

life. It can reach also neglect because the professionals tells you he needs speech therapy or he needs occupational therapy. And the father says, no, no, no, that's in your brain. That's your brain there's a problem. He is fine. He's a little bit strange. It's his mother who does him to be like this.

We have so many difficulties from schools, from professionals, to get the parents to accept what's the problem of the child what we miss early intervention, early years, early therapeutics. And, of course, within the family, there is a lot of fighting between one or the other parent. Sometimes there are grandparents involved also and some others also, other relatives. That makes a drama. I saw that here. I saw that in different countries, believe me.

Dr. Insel: We can -- John, if it's helpful, we can get the paper from the *Journal of Autism Disorders* and have that circulated so people can it.

Dr. Varsou: I sent that already to you.

Dr. Insel: Yes. We just haven't -- I don't think we have --

Dr. Varsou: I sent that already.

Dr. Insel: We have the reference. I don't think we've circulated the paper, so if that would be of interest. So, Jan, you had your hand up, and then Geri.

Ms. Crandy: I've seen that denial does delay treatment, which has to go with the ethics and the ethics of the providers, too, because a lot of times providers, early-intervention providers want to wait until the parents feel more comfortable, and they are giving them more time, and it delays treatment. So it is an issue out there.

Dr. Insel: Geri?

Dr. Dawson: Well, I was just going to mention that there actually is some research on, you know, the use of assisted canine therapy dogs in autism and even some clinical trials. There was recently a review of that area of research that was published.

I think 14 different studies have been done, and a lot of interesting -- kind of comments around, you know, dogs have the ability to use joint attention kinds of behaviors with alternating gaze. And also, you know, when you're exposed to a dog, there's been good evidence it increases oxytocin levels and so some really interesting work going on in that area. I just wanted to mention

that.

And then in the area of music, in the most recent round of the Autism Centers of Excellence Awards, Helen Tager-Flusberg's project focused on treatments for minimally verbal children, there's one project at least that is focused on a music-based treatment protocol. So I do think, you know, these are things that need more research, but it's not completely neglected.

Dr. Insel: Other comments?

Ms. Abdull: I want to see if I can just bring out maybe comments and questions about we always get a lot of parents that write to us or come here that are usually mad at IACC, which is how the GAO got the information from the Congress they represent. So I want to answer if I can, at least for myself, that to many of the parents that are upset, that at least as an IACC member, we hear you. And I think a lot of the things that you're saying in terms of the environmental stuff and, and Anshu can speak to this, and a lot of the immune and a lot of the GI issues, it is being addressed on the Plan that we just voted on along with the previous Plans.

And the other thing I want to see if I can

answer and broadly to parents that write to me personally or write here that are usually just mad at the Federal Government is that as a mom, autism in my home, it's an emergency every day. But if you look at it from the scientific point of view, it's different lenses. And so, while, you know, 1 in 32, in Somalia that's horrible. One in 88, it's bad.

But if we look at it from the scientific point, we have to give research, as Dr. Insel always says, time. And so, if I can just say to the many, many parents who are really mad, I really want to say that, you know, Rome wasn't built in 1 day. It does take time. But IACC does hear your concerns, and many of them -- such as the GI, the immune, the things that Lyn has fought for -- are part of this and are going to be part of the future studies. Thank you.

Dr. Insel: Jan?

Ms. Crandy: And I do feel the public's frustration. You know, I had a different vision when I came and joined this Committee, too, thinking that we could do much more than we could than just track and encourage research in different directions.

And have we done our job in that area? I do

believe that we have. Have we solved the problem? No, we haven't. We have a lot of work to do. And are we affecting those families every day that need our help? I don't think that we are, and I think we need to find a way to do that.

When I'm looking through these public comments every time, I feel these families. I see them. I'm out in the field, so I see families every day, and they do need our help. One of the things that I could -- that we could -- solve in here, I think maybe they don't always feel like their voice is heard. There was a comment in here that the public comments don't get posted on the website. Is that something that we can start adding those onto? I went back because I thought, no, that can't be true, but I went back and looked through. I don't see that we ever posted the public comments on the web-site.

Dr. Daniels: Yes. Our Office had been working on developing a database for the public comments. However, there are a number of legal hurdles to putting those comments up. I've been in communication with our legal experts within NIH and probably will have to talk to the ones in HHS in order to work through all of those legal issues

before we could ever post public comments. So it's not a simple, easy answer. Even if we develop the database, it will have to go through multiple rounds of clearance and approvals and so forth because of, especially, The Privacy Act and so, unfortunately the CAA and The Privacy Act kind of conflict with each other. And this is common in government that you have multiple rules, regulations, and laws that are in conflict.

Ms. Crandy: Could we maybe add a comment then on the website that says why we're not posting public comment -- that it's to protect privacy issues or something like that?

Dr. Daniels: Even that I would probably have to get legal clearance --

[Laughter]

to put such a statement on that would, you know, it would have to be approved by all the legal folks that it was -- but I have been working on it with our team, and we have actually developed a draft of the database. But it's really the approval process that's going to take some to work through. So in the meantime, you know, we do provide it to the Committee, and if individuals write and ask for specific comments, we do send them out. But we're

not able to post them on the web.

Ms. Crandy: I do hope that the public realizes, though, we do need a voice. Autism community needs a voice. This is our voice. And we need to reauthorize. And I hope that our community comes together so that we continue to have a voice.

Dr. Insel: Lyn?

Ms. Redwood: I want to say first ditto to the comments that Jan just made. I feel the same way. We had a very long discussion -- well, short discussion, I guess -- at one of our last IACC meetings in July about how to respond to the public comments. And you know, we have several written comments in here that are excellent that really deserve a response, and I do think there's a way we could do that.

There was one that related directly to the Department of Education that had questions that I think DoE could answer. There was one that had questions just about the whole process of updating the Plan and how we went about it, how we obtained the research. I think we could respond to that.

There's questions in here again about comorbidities. And personally, I'm feeling very frustrated because we had a wonderful presentation

in July on comorbidities and autism. And at the end of the meeting when we had our opportunity for the Committee to discuss, there was a vote that was unanimous to establish a working group to focus on medical comorbidities.

And that was 6 months ago, and I know I've emailed several times, Tom, asking what's the status. Dr. Perrin had volunteered to serve on that committee. It's something that's important, and these families want us to combat autism and do something now. We've waited 6 months and haven't even begun to establish that committee. And now we're looking at this IACC ending. So I know personally I'm very frustrated because I think that's low-hanging fruit where we could be helping families now, and we could be disseminating information.

So I would really like to see us do a better job and be more aggressive about really combating autism and helping these families. You know, at times I'm just so incredibly frustrated serving on this Committee because I feel so, you know, sorry for these parents that are out there struggling, and they do turn to us for answers. And I think we're letting them down in a lot of different ways.

I encourage everybody to read the public comments if you haven't read them. There's great public comments in here. I think Lisa Ackerman said something with some wonderful ideas, creating the next IACC. There were just some wonderful comments in there -- Katie Lewis, Jill Rubellino, again, Carolyn Gammicchia. So, you know, I think we really need to look at these and maybe even set a time aside to specifically address these public comments in some way.

Dr. Insel: That's what this time is. So this is a good opportunity.

Ms. Redwood: No, but there's not enough time to go through each and every one of these. And I know several of the meetings -- I think our last meeting we didn't have time at the end of the day to do public comments. So, you know, I think if there's some way we could at least respond to them in some written format saying we hear you, we're looking at this.

Eileen Nicole Simon has how many times been in front of us talking about the auditory brain stem. She brings forth a very strong hypothesis, and we've never discussed it. So, you know, I think at least getting back to her in some way and saying,

yes, you know, this is important. And, you know, I think there may be something in the Plan that you could speak to, Walter that would address research looking at the auditory nucleus in the brain stem and the effects of anoxia and asphyxia.

[Pause]

Dr. Koroshetz: Yes. I mean, the difficulty is, you know, it's not like 30 years ago when you didn't have any clues. Now we have a lot of clues. The question is which ones are the important ones, and that's actually tricky business.

So I think, you know, the study, the different neural systems, understand how they contribute especially during development, I think that's the key thing. Picking one versus the other, I think you have to see where the direction goes in terms of where the evidence is. I think the auditory system is important, particularly because language is important. But the evidence of damage in these nuclei I think is quite sparse. I mean, it's an interesting hypothesis. Somebody needs to look at these things.

I think that's one of the things IACC can do that no other organization can do is put these things out there for people to kind of say, you

know, I can look at that nucleus as I'm doing this, or I can look at it when I look at sensory language skills, verbal skills, how sounds are processed. People will be pointed in that direction, the scientists.

I think there's a little bit of false expectations that science can be done like an engineering project, like, somebody at the top can just -- you know, if you just had a wise dictator, they could tell you exactly how to get to the answers. But you know what, that would probably the worst possible thing to happen because the dictator would probably be wrong 90 percent of the time.

So I think this mix and chaos is actually not a bad thing. And I think that this group contributes tremendously to the very different set of goals and expectations. I think managing the expectations is the hard thing. I read these comments. I feel terrible. I feel really bad. But, you know, I came to NIH because I wasn't happy. All the patients I treated are dead, and that's why I said I'm not doing this anymore. I'm going to go to NIH and work on something that would maybe stop this from happening, but it hasn't happened. The Huntington's patients, we still don't have a

treatment.

But this is a hard problem, and anybody who thinks there's a shortcut answer, you know, you're really gambling. This is a hard problem. You've just got to have patience. You've got to support people, get people interested. The one good thing about IACC and autism research is it was a desert 20 years ago. No smart person would go into autism because there was nothing to deal with. Now, you have like the smartest people in the world studying autism.

So I think, you know, we don't have -- we're not to the goal line, but we're definitely making progress. But it's hard. I understand because of the human tragedy that's occurring it's very hard to think in terms of the timeframes that we have to deal with. But there is no other shortcut that I know of or anybody else knows of.

Ms. Redwood: Tom, what about establishing the work group -- I can't remember the exact title that we had -- that we voted unanimously at the last meeting to establish?

Dr. Daniels: So we've been pretty active working on the Strategic Plan, and that's been our focus now, but we have just completed that. But

with the comorbidities group, you and Tom Insel were the only two people who volunteered to be on it, so we can get you together.

[Laughter]

Dr. Daniels: And I suppose if there are others that want to join that group, then --

Ms. Redwood: I think Dr. Perrin had agreed as well.

Dr. Daniels: He had said that he was willing to participate as an invited person, but he's not a member of our Committee.

Ms. Redwood: Right, but the particular structure that we discussed during that meeting would allow for outside people to come in and take part in the deliberations.

Dr. Daniels: So this would be a planning group of the Basic and Translational Research Subcommittee.

Ms. Redwood: Right. And then that information can feed into Updates for the Strategic Plan and those areas.

Dr. Insel: My understanding was that OARC had asked for a respite because they were dealing with so many other things before they went forward with this. But now that the Strategic Plan is off or

about to be off their desk and the portfolio analysis will go out, and the CAA report will go out, I think there will be a chance going forward.

Ms. Redwood: Tom, do you feel like we need more resources where we could actually deal with more than one thing at a time?

Dr. Insel: It would be great to have more resources, but any resources we put into the Office right now we're taking out of our research portfolio. So we have to figure out how much we want to pull out of research to put into the Office of Coordination.

Ms. Redwood: There was something in the original CAA language that said that we could request for more support from the Secretary. Could we consider sending a request for more support for staff and instruction?

Dr. Insel: We have done that many times.

Ms. Redwood: And?

Dr. Insel: And we've been told that additional -- any funds, -- any funds for the Office of Research Coordination and the IACC will come out of your research funds. So if it feels like we're a little short-staffed, we are.

Ms. Redwood: Yes, but I'm really confused

because I didn't think IACC had any research funds. I know the institutes have research funds, but IACC doesn't have a dollar amount for research.

Dr. Insel: So just to be clear, what I said any money that goes into the IACC is coming out of, in this case, NIMH research funds. So my institute is taking money out of its research portfolio to support all the people in the Office of Autism Research Coordination. If we want to do more of that, which would be great, we'd be pulling it out of the ACEs, or we'd be pulling it out of one of our research projects.

And I suppose if there were a lot of duplication, that wouldn't be so hard to do, but I'm not convinced there's any. And so I'm loathed to rob the research funding to provide more of this. And I think we can get it done. I think we've had a lot -- we've thrown a lot of things at the Office, but we are at a turning point with this.

With a bunch of the reports going out now, there'll be some breathing room, and I think this will be the time we can start to look at what is really a workgroup like we had talked about last year, and we had talked about a number of places.

But the comorbidity piece was the piece that

we had decided we'd go forward on. So I think we'll come back around. I agree.

Ms. Redwood: One last comment. Someone presented information about acetaminophen that I think needs to be considered as well and investigated. That's all.

Dr. Insel: Other comments from -- and it's great. I'm really delighted to hear people talking about the written comments as well as the oral ones because they often don't get enough attention from us. So that's really important.

And I do want to revisit Jan's issue about, you know, I hear that there are legal concerns about how we make this public. But we should just think through a little bit, I think if people have come here and they've given oral comments in a public session, a little hard for me to understand what the difficulty is in providing the transcript of those comments. So we'll have to take a look at that.

Dr. Daniels: As a clarification, the transcripts are published, but in terms of putting up the comments individually, we're putting everything into one database, and so we haven't separated out the oral from the written in terms of

the database. But the whole database, to put it up, we have some legal issues that we would have to resolve before we could do it.

Dr. Insel: So just to be clear then, Dr. Varsou's comments to us today would actually end up on the website?

Dr. Daniel: They would be in the video. Her oral comments would be in the video. So written comments are the ones that are currently not seen on the website.

Dr. Insel: Okay. Jan?

Ms. Crandy: So I know I might be naïve and stuff, so I don't always understand how the system works.

Dr. Insel: That's called rational, not naive.

[Laughter]

Ms. Crandy: Right. So IACC, though -- if on reauthorization we say to Congress we need more funds to be able to do our job, isn't that something that we can include in that? If we wanted to say this Committee should be able to do more things or --

Dr. Insel: Yes. So the way it works -- and Linda made this comment before -- is that the reauthorization process is done by a committee that

says “thou shalt do X.” The funding to do anything comes from a whole different committee and a different process called the Appropriations process. And what makes Government sometimes so vexing is what we call “unfunded mandates.” The authorizers say do this and the appropriators never give you any money to do it, so you have to take money from something else to get it done. That's what we're struggling with here.

There is language in the Combating Autism Act, but it's a little bit ambiguous about just administrative support for the Committee. But certainly there's never been any intent, even in the authorizing language, to provide funds to the IACC for a large research effort. It was always understood that this was monitoring and coordinating and creating a Plan, but that the funding to do the actual work would go through the agencies. And that does happen through the appropriations process. Alison?

Ms. Singer: So not to put him on the spot, but sort of to put him on the spot. Since Stuart Spielman is here, can we hear from him about where we are in the process of reauthorization?

Mr. Stuart Spielman: It remains to be seen,

Alison. It remains to be seen.

Ms. Singer: Okay.

Dr. Insel: So the answer for those who couldn't hear is that it remains to be seen. But the reality is that we're really in a hard sun-setting date of September 30th. And this is a -- it's very much in process. We'll have to see.

We're going to give you the last word, Noah, because you've been so quiet.

Mr. Britton: Thank you. Quick question. So assuming the sunset actually happens, do we need to formulate a Strategic Plan before the end of that?

Dr. Insel: Unpack that a little bit. What do you mean?

Mr. Britton: So if we do not get reauthorized, are we mandated to have to make a Strategic Plan 2014 before September 30th?

Dr. Insel: No. No. So this could be the last Update. And if we are reauthorized, it's very likely that there'll be a new process with a potentially new membership. And this is what happened last time, and it took a year or so just to get the car back on the track. And then we'll probably do another new Plan.

So it's unfortunate that there's no real

consistency to this process and you work in either 5- or 8-year cycles, but we're coming to the end of one of those cycles. In this case, the 3 years on top of the 5 years we had before. So 2006 was really our starting point. Idil, last comment.

Ms. Abdull: I just want to add also in terms of reauthorization, if people want to -- who are listening who are here, when you take off your IACC hat just as a regular member, you can contact your Congressperson, your Senator, especially if they sit on the HELP Committee or the committees where this went through, or Congressman Smith or Menendez, the ones who wrote the original one.

And you can also ask funding for that to be added so that it's not just authorized, but we can ask funds to be added to the appropriations. Last time they told us no, so they'll probably say no again, but it doesn't hurt to ask again.

And I also maybe would suggest asking if we can make it longer than 3 years because it seems like when you get new membership, and as fun as going through NIH security is, I don't think I'll be back. But when you get new membership, it takes another year for people to get used to, to read all of this. And then by the time the year comes,

there's a new Strategic Plan. So just now when finally we're understanding and we want to make changes, oh, we have to worry because we have to reauthorize.

So it would be good to get maybe a 5-year. And I would just ask people it is -- I mean, it could be a headache, but contacting your Congressman. They need your votes. The ones who are up for 2014, I would target them.

Dr. Insel: We're going to need to move on, but, Scott, related to that?

Mr. Robertson: I just have a real question on that. The original timespan with the first version of the legislation in '06, was that 5 years? So way is it -- I never understood the backdrop of why it became -- it turned into 3 in the last reauthorization.

Dr. Insel: It was just a reauthorization and it only done for 3 years. And why that was selected instead of another 5, I don't know.

Mr. Robertson: Oh, okay.

Dr. Insel: Okay. Thanks, everybody, for that discussion.

Dr. Insel: We're going to go into hearing from some outside speakers at this point, and I'd like

to begin by introducing Dr. Ami Klin, who is Director of the Marcus Autism Center at Emory University. He's a Georgia Research Alliance Eminent Scholar, which means a lot because that's just about as eminent as you can become in the State of Georgia if you're a scientist. And he's Professor-in-Chief of the Division of Autism and Related Developmental Disabilities in the Department of Pediatrics at Emory School of Medicine.

Internationally recognized for his work on the social mind and brain and aspects of autism from infancy through adulthood. We talked early this morning about his eye-tracking results and recently published in *Nature*. And those are beginning to give us the first really good glimpse of some very early changes in visual attention, which potentially could serve as a biomarker at some point.

So, Ami, terrific to have you here. Thanks for joining us.

Dr. Ami Klin: Thank you. Thank you, Tom. Thank you, Susan. I see a lot of friends and colleagues all around, so I feel at home.

I am a clinician of some 23 years or so, and

I'm an investigator. And when I was asked to come here, I thought of talking about strategy, talking about impact hopefully that we all would like to impact on the interests of families. And so I was thinking about a title, and as a clinician, the diagnosis of autism, the definition of autism, as a cluster or a sentence is, of course, critical. We serve families. We need to establish eligibility. We need to create programs of treatment.

But as a clinician as well, I've seen a lot of babies in my life, followed them for a long time. And the feeling is that autism from that standpoint is an outcome, and we to – we really need to look carefully into the unfolding of this position, particularly early on in development.

Some of you know me of 20 years at Yale, and I and a bunch of colleagues moved to Atlanta about 3 years ago because there was a very interesting confluence of institutional commitments to make autism a priority there. So the Marcus Autism Center -- it serves as a division of autism at Emory at the School of Medicine, but it's also part of one of the largest systems of pediatric health care in the country called Children's Healthcare of Atlanta.

There are lots of people to thank here, and the foundations, and certainly NIMH and NICHD have been involved in the research for a long time. My colleague, Warren Jones, we've been working together for 14 years, and the families that have contributed to this research and those foundations that actually help us train our brightest and our most promising.

So straight into the context: We know that autism is a neurodevelopmental disorder primarily of genetic origins. And we know that early diagnosis and early intervention is really critical for us to optimize outcomes for our children, for adolescents, and for adults. And this is not a controversial statement. The American Academy of Pediatrics has, in fact, recommended that we screen children at the ages of 18 and 24 months, so there has been maybe a low uptake of that recommendation by the AP for several reasons.

One of them is that maybe we need better tools. Maybe we need better dissemination of tools. And also we need to work with our primary care physicians to convey to them that there is much to be done and that they can raise the alarm because we can actually impact on children's families.

Despite of that, it is still the case that the median age of diagnosis in this country is still quite late into the fourth and fifth year. And that's a problem. This is missing an opportunity for those of us who know about that window of opportunity afforded by neuroplasticity; we cannot miss that.

It is also the case that there is a huge biological question given the fact that in some sectors of the community, we have major health disparities in which the age of diagnosis lags still, and we are basically condemning whole sectors of our community to have children with the worst outcomes. We're still working on better community-viable systems of care and reimbursement processes in autism for those of us who are in the trenches and trying to serve families. It's still underdeveloped.

So this is a simplistic slide, but there is a sense that the age of diagnosis matters and that early intervention matters and that we have something -- we have a bit of a challenge here. We need to move that bar of the age of diagnosis all the way to at least the age of 2 and 3. Right now, less than 20 percent of children who carry an

autism exceptionality during their school years are actually identified before the age of 3. This is a part of the report to Congress by the Department of Education.

And we know that autism may be reliably diagnosed by the age of 24 months and 36 months, and we have that 2 to 3, which is part of our Part C Early Intervention providers' mission, to get children to speak because many of the children who speak by the age of 3 are children who will not have to come to the Marcus Autism Center and then require treatments that cost in excess of $100,000 a year because their several behavioral challenges are basically keeping their families in a state of siege at home. But we also need to have a sense that autism unfolds, and it unfolds in the first years of life. And that’s what I would like to focus on here today.

So this is the Marcus Autism Center. It's a 90,000-square-foot building. This is a picture taken on Sunday morning. Usually our 200 parking spots are filled. And it's one of the largest, if not the largest, center for clinical care for children who have autism and their families in the country by several factors. Over 5,700 unique

children seen just in the past year. We are involved not only in clinical evaluations but also in a whole range of treatments and the care coordination, advocacy, and certainly there are no walls in that building. You saw walls, but you didn't because we embrace the community, work very closely with the governmental agencies and other factors there.

And certainly the past 3 years we've become a very comprehensive hub of clinical science. Really with a portfolio that ranges from molecular genetics all the way through social mind and social brain and tools for community empowerment. And we are proud to be one of the NIH Autism Centers of Excellence.

Now, going back to autism, it's one of the most strongly genetic conditions. If I'm a parent of a child with autism and now my wife is pregnant, 1 in 5 of those children are likely to also have autism. This represents a 20-fold increase relative to the general population. But there are many genes. There are many mutations out there, and none of those mutations have accounted for more than a very small number of cases.

And we need to remember that genes don't call

for symptoms. They call for proteins to build brains and bring babies into the world. The fact is that all of us carry a lot of mutations, but most of us don't have a disability.

So autism is a very complex genetic condition. It's not like Huntington's disease with one gene and highly penetrant. And so those complex conditions allow us to dream at least that there is no genetic determinism, that we need to understand how those genetic vulnerabilities really are substantiated. And they are substantiated in such a way that on the right-hand side of the slide, you have the cluster of symptoms that we see in autism.

But between those two, there is something called development, and here is the notion. The notion is that we get from here to here by disruption of development and development that really makes it possible for our babies from very early on to engage with the world. Well, if so, then we need to focus a great deal on those first 3 years of life.

And sometimes when I'm speaking to folks in the community and I'm telling them about treatments that might be community viable, I have to remind them that babies come into this world ready to

interact with people. From the first hours of life, they like to listen to human sounds and to look at people, even looking at people they prefer to look at people's eyes rather than other parts of the body simply because this is the way that nature solved that problem.

A baby and a caregiver -- without the caregiver, the baby would die. And, in fact, there's this mutually reinforcing choreography that happens that becomes the platform for brain development. And that's an interesting idea because it has implications, including practical implications for the way that we're trying to address autism as a public health challenge.

And so, the same way that we don't see a genetic determinism, we have to remember that the brain -- well, the brain only sort of determines who we're going to be. The brain becomes who we are. In many ways, the brain is the repository of those experiences. And so we need to remember that those early experiences matter and matter a great deal.

[Video presentation]

Dr. Klin: And so, I remember that little girl very well. We saw her many, many years ago. And as

a clinician, as I walk into a playroom, I know that my presence should alter the other person's mind, the other person's reaction. And I recall this little girl, who was 15 months at the time, and she had an older brother with autism. What was so interesting to me as this walking laboratory of social engagement that I feel I need to be in order to be an effective clinician is that she could ignore me so much. I was 2 inches from her body.

(Video presentation)

Dr. Klin: So she ignored me even if I was 2 inches from her, but she could see an M&M that was about 5 feet away from her. So it's not as if she doesn't have intellect, as if she doesn't have perception. But her world is slightly different than the typically developing babies that I had been working with for such a long time.

So we had to really get into her mind, really get a sense of what does this internal world of hers look like? Is she not treating me as a social object? And so we developed those point-light display animations, and see what you think of it.

[Video presentation]

Dr. Klin: Well, you get the idea. Everything that you are thinking about happens in your mind.

It didn't happen on the screen. Those are point-light displays, but you can fill in the blanks, as it were, because the kind of movements that you saw is the movements that we call biological motion, which is the motion of living beings.

Now, don't feel too proud of yourself because not only that babies are born with a preferential orientation for those kinds of movements, but dolphins, and cats, and even newly hatched chicks.

It's basically a way that, again, nature created a solution. Something that moves like mom, I'm going to follow, and that's the way things are. And so we tried to capitalize on this in order to get a sense of what's going on in the mind of that little girl that you saw before. And so, here we have a typically developing 2-year-old, and she's looking at the animation of a caregiver upright, and here is the same animation, but upside down.

And this is basically -- this across here tells exactly where that 2-year-old is looking at.

[Video presentation]

Dr. Klin: So you had a sense that for this little girl there was no problem. She forgets that these are point lights. She is seeing people, okay? And that's, once again, a great nature solution.

Now, what about that little girl that I showed you before? Well, when I showed to her those kinds of upright inverted animations, she was basically random. So she was not necessarily differentiating those social contingencies from physical contingencies, which is basically light and sounds happening on that screen. And when we compared that with two other little girls -- one was 15 months old and one was a 9-month-old -- they both showed a strong preference for the upright, meaning they're matching that template, okay?

So we went on to study this phenomenon with groups of children, with 2-year-olds with autism, developmentally disabled, but not autism 2-year olds of typically developing children. And very quickly, what we found is that what was true for that little girl was true for a lot of 2-year-olds with autism, that they were really random. They were not making a differentiation between those two kinds of stimuli.

And then we had one particular animation, which was a pattycake animation, in which they showed us that in some situations they did care. And this is what that little girl showed us.

[Video presentation]

Dr. Klin: Well, you've just treated that as a person, but it seems that she was treating that as basically lights and sounds happening, basically as a physical contingency, okay? And so, we have to quantify how much other visual synchrony there were in those kinds of animations, and this is what we saw.

[Video presentation]

Dr. Klin: The hotter the color, the more visual synchrony there is there. So there was a lot happening here. But we hadn't planned that. Something is happening here, too. Why I'm showing this to you is because we went on to complete this study, and we found out that about 90 percent of the variance of the visual behavior of those 2-year-olds as they're watching those animations could be predicted on the basis of audiovisual synchrony, which is a physical contingency, something that is very, very, very different from the social value, those stimuli. And children who are in the reciprocal group or the non-autism developmental group, they couldn't care less about the audiovisual synchrony.

Why was that important to us as I was trying to understand that little girl? Because when she

was watching the caregiver, this is what she was doing.

[Video presentation]

Dr. Klin: So what she was doing, she was looking at that caregiver's mouth even though from the first hours and days of life, our children, they fall in love with people through their eyes.

The eyes are not only the window to the soul, they are the windows to the social brain. So the hypothesis was that, oh, maybe she was not treating that face as a person. And what happens in the mouth? Well, you have a great deal of audiovisual synchrony as lip movements and speech sounds are, of course, covaried. They are synchronous.

And so, we had to go on and quantify how much audiovisual synchrony were in those faces, and this is what we found out. This is the work of Jennings. What we found out is for typically developing children, those audiovisual synchronies in the face were basically not there. But for our children, not only that we could predict their focus on the mouth, we could also predict their focus on the eyes.

Now, what does that mean? It means that it's not that our children cannot develop relationships,

but they're developing relationships differently, and we'd better understand that, because remember, the brain becomes who we are, so the way they're learning about the world is becoming crystalized.

And so, as a clinician I can tell you that 23 years of finding out about our children's special interests, their circumscribed interests, their interests and attachment to a whole range of objects out there, they are not necessarily social objects. Well, there is a reason for that, but this has been happening for a long, long, long time, and we need to understand that.

And so, we had this kind of idea. We have growth charts for physical height, and weight, and all this kind of fun, but we don't have really growth charts for social engagement. So imagine that we sort of thought about autism in a different way, that really if it is a disruption of this highly conserved and developmentally early emergent skills and those things are really online from the first days and weeks of life, maybe if maybe we could quantify those; we'd be able to push our ability to detect deviation from those processes and maybe markers of autism very early on, much prior to the time that the children are actually

able to be diagnosed reliably by an experienced clinician. So that's very simple. And I'm sorry, Cathy, I borrowed the CDC chart.

So not only that we did that, we created an entire strategy for research that really goes from the way that we see patients all the way through the entire cycle of disciplines that we believe can help us understand early development, okay? And we created the Autism Center of Excellence around this principle as well.

So one of the projects really focuses on tracing, mapping, quantifying social visual engagement from the time that the child is born all the way to 36 months. But we heard about today vocal engagement is equally important. So we're also tracing the vocal engagement of our children from the time that they're born all the way through 36 months using the same principles to create probably what is the earliest randomized control trial on the same principles. The name of this intervention is called social interaction.

Amy Wetherby and Cathy Lord have been working on this for some time. And because these are highly conserved skills, we also focus infant rhesus monkeys, our colleagues at [Inaudible comment] is

more about that momentarily.

But we created labs that duplicate our experiments with infant rhesus monkeys, and we followed them from the age of zero to six. They also allowed us to a lot of mirror imaging so that we can take a look at the way that the brain is forming and early social experiences are impacting on brain formation or brain connectivity or the way that the tracks are formed between different important nodes of the brain as those things are becoming the repository of those infant rhesus monkeys experiences.

Now, this is Warren Jones, and this is our baby lab. And you see this is a 5-month-old typically developing child, and this is a very noninvasive technique, and they're happy. They're happy because they're watching caregivers. They're watching their moms.

[Video presentation]

Dr. Klin: Now, as they are doing that, we're collecting data at the rate of 120 times per second so that we can really have a good sense of not only qualitative but a highly quantitative way of knowing what they are engaging with in their world.

And this is the paper that came out about a

couple of months ago in which we could use those kinds of principles to identify markers of the deviation of that process of what we expected. And we were astonished by the fact that within 24 hours of the online publication of that paper, it had been disseminated through 800 alphas around the world. So you guys, this Committee, has an enormous responsibility because the visibility is incredible, and I as a clinician, of course, as an advocate, I take that extremely, extremely seriously.

But this is what was happening. Imagine this is a 5-month-old typically developing infant looking at a caregiver, and this is what, you know, that child is focusing on. And this is now a 5-month-old little baby who eventually was diagnosed with autism, and you see what that baby is doing.

[Video presentation]

Dr. Klin: Now, going through greater quantification. So here we are. These are data points that go from 2 months to 24 months, and this is fixation on the eyes, which I told you is the window to the soul, as well as mouth, body, and object. And these are now growth charts of typical development, typical engagement with the world.

Okay, so now we know.

And look here that there is now an increase, a ramping up of the mouth curve. And the reason is that by this time, the babies have found out that something is very important is coming from people's mouths. It's called speech. And now that speech has signal.

Now, this is what happens with the babies who develop autism. They start over here, and you see the unfolding autism in the first 24 months of life. Now, as we look at this, here you have the curves, and in this curve you have what we call the first derivative, which is basically the change. And you see that those two curves, red, the babies became autistic and blue is the typically developing babies. And you see that we are able here to begin to differentiate those two distributions.

You see that for typically developing babies, the way that this declines is at a much higher rate, and all of a sudden you're seeing that you're able to segregate those two groups quite well actually in the first 6 months of life. And here's what we expected, that with the children who have autism, initially it goes down. This is for

objects. But in the second year of life, they are finding it's a newfound love for objects. So they are basically becoming interested in and becoming specialized in basically learning about objects, and we can't separate those two.

And so, we did this thing called a principle component analysis, and what we found out is that those curves of mean decline in eye fixation were basically predicting the level of disability that our children were showing at the ages of 24 and 36 months. And this is based on that experiment.

But we are trying to really get aggressive here. Let's look at the first 6 months of life, and let's see what can we learn from that? And here are the curves for eye fixation, for mean decline for the children with autism, and here are the typical children, and here you have the rates of change. And this is what we did.

So we compared those things, and what we found out is that those curves for the first 6 months of life for the typically developing babies and for the babies who later were diagnosed with autism were quite different, both for eye fixation and for body fixation. And then we conducted -- I'm not going to bore you to tears with this -- an internal

validation using something called leave-one-out cross-validation.

And we found out that we could actually separate those distributions quite well based on data for the 6 months of life. And this is how we could separate using both of those measures. And then we saw six independent cases, and they also fell within this scheme of classification.

So this is just an illustration of the kind of stuff that we're trying to work and what kind of implications will they have. It's still a very small study, and we're working hard on enlarging the number of children, but were those things to be replicated, we ought to be able to create a much more performance-based and quantified form of screening for our children, because the only way that we'll be dealing with health disparities in this field is by doing what people did, for example, with PKU. It has to be universal screening so that we don't leave whole sectors of the community outside of this story.

And so, we need a high group with low costs, and we need to deploy this for the trenches, and the trenches are our primary care physicians. Every child should have a medical home, and this is the

way that we have to intersect with the community.

And it has to be viable within that context. Of course we are all working on better methods for early detection and intervention because our interest is in preventing the burdens of autism. Nobody is in the business of preventing autism.

It's in the business of preventing the associated burdens -- the intellectual disabilities, the language disabilities, and the severe behavioral challenges. Now, we are working on that, and hopefully we'll be able to present something to you within the next few years.

Now, let's think about one thing that really exciting to us -- age in the first 6 months of life. These are the typically developing children.

Now, these are high-risk siblings. These are siblings who were unaffected, and you see that the curves here for the first 6 months are very similar to those. But look, these are children who have a sub-threshold form of autism that somebody was very concerned about them, but they did meet the formal criteria for autism at the ages of 24 and 36 months. They are very different, actually statistically and significantly different from those two. And here for you to get an idea, these

are the children who later develop autism.

Now, if we're looking at the eye-tracking data as an assay, as something that can actually signal or parallel the formation of this condition, then this is what we should be able to get. Say, just taking the eye-tracking mean decline. These are now 16 children who are siblings. They're high-risk siblings. But they were unaffected at the end of the process. And basically their eye tracking data was very similar to what we get for the typically developing children.

Now, these here are 12 children, 12 siblings, that in a way they started the process with a decline very similar with the children who have autism. But then something happened. There was a course correction. This course correction happened over here. This is, remember, the change, and it happens around the age of 18 months. But from a biological standpoint, what we want to understand is when something kicked in, when a biological process kicked in. And when we look at the second derivative, which is the rate of change, when the system began to change, it really is around the age of 9 months. And those children here, they were of those 12, 10 of those had a sub-threshold form of

autism, and 2 are completely unaffected.

So it gives a sense of -- a glimpse of sibling resilience. But it goes beyond that because if something kicked in, what was it? Was it something that we can clarify from gene expression and methylation studies given the fact that gene expression is really critical? Remember, the early social experiences will also mediate some gene expression.

But even, you know, we need to catch up with colleagues in other areas because the genotype for those children might be different, and maybe they have something that are plastic -- they are more susceptible to environmental influences -- and it takes that amount of time for development to catch up with that plasticity. And needless to say, if that happens in the state of nature, can we actually potentiate it via treatment? So now, we already would love to have started our treatments at the age of 9 months, not at 12 months, but we're learning.

And then there is issue of Williams syndrome, which is a very low-prevalence condition, but it's one that is of tremendous importance to us. If we try to understand mechanistically what is the sub-

threshold for that kind of social visual engagement given the fact that these children are known to have intense eye contact. In fact, they become socially disabled because they cannot unglue from looking at others.

And so, the idea is this. We know that this -- it's about 25 genes in chromosome 7. It's a deletion syndrome. We know that in autism we have the application in those areas, and sometimes children also develop autism. But most importantly for us, we need to study those 25 genes because if something happens there that actually can make it possible for us to better understand this process of unfolding social visual engagement, it's going to be important.

And we have, of course, a group of collaborators working with us, Steve Warren's group. But here is the story. The story is that we, Warren and I, were planning the study, we expected, and here was the hypothesis, that our children were born with an attenuated sense of the other. But if so, their visual engagement would be flat. It will be low. This is not what we got. Remember, this is the curve for the children who have autism. So what happens over here?

And so, this is the hypothesis. It's just like with every single set of human skills. There is a difference between what happens in the first weeks of life and what happens subsequently. The first portion of the skill is really reflexive and is experience expectant. It much more emphasis by genetics and is sub-cortically controlled. And then there was a transition. In a way what happens later is that this behavior is coopted. It's coopted in the service of a higher level function. And now eye fixation becomes interactional, becomes reward driven. Our babies are now smiling, and they're engaging with the others, and is experience dependence or highly dependent on what happens in children's real lives, and it's cortically controlled.

Well, that creates a couple of hypotheses, right? It could well be that somehow that system became arrested at this level and did not transition to this level. It's hypothesis. We have to follow.

Now, in our studies with infant rhesus monkeys, we created an eye max in which we do eye-tracking studies for little infant rhesus monkeys with those colleagues here. That's exactly what

we're following up because we believe that if we are to fully understand that mechanism, we need to understand that. And there are possibilities for us to do repeated imaging of those monkeys, which is exactly what we're doing every 2 weeks.

And the idea is that if those baby monkeys, they are benefiting from those early social experiences, we should see the repository in tractography because we are seeing connections that are becoming stronger between specific nodes of the social brain, and we're following that.

Okay. So we are following human development neuroimaging. We now have a very specific hypothesis about specific transitions that should happen at a moment's time that comes from our human studies. And we are replicating that with the human monkeys. Not the human monkeys, the infant monkeys. So here's another little story. We are a center for treatment.

Dr. Insel: Ami, we're just about out of time.

Dr. Klin: So I might actually be able to make it.

Dr. Insel: Okay.

Dr. Klin: If people understand that I'm illustrating stuff, that I'm not giving you a

comprehensive presentation about our center. A major focus of our center is treatment, so we have a very comprehensive set of programs that really focus on skill acquisition, classroom-based interventions, feeding disorders, severe behavior challenges, and you name it. Psychopharm and parent training, and these are my colleagues who are working very, very closely on that.

But one of the major challenges that we have in the field of treatment is that we need to quantify autism because certainly the psychopharm domain, none of our drugs actually are addressing the core symptoms of autism. They are very important. They're addressing burdens. They're addressing things that really create a lot of suffering for our children, for adolescents, for adults, and for families. They're important. But we're not addressing the social disability quite as yet.

And one of the key aspects here is that we can't quantify that social disability or social ability in substantive enough ways that is going to -- now to use the language of the Foundation for the NIH – de-risk the investment of big pharma companies into new compounds that are going to help

children.

And so, we also are placing a lot of emphasis on how can we quantify sociability. Believe me, if you are doing this kind of research and all that you do is basically use a rating scale that goes from zero to four -- and we're talking about a chronic condition, a lifetime of a condition -- then you need something that is quite sensitive in order to show that that particular compound is having an impact on the child's life.

So this is the platform for brain development. This is our research of toddlers now.

[Video presentation]

Dr. Klin: Everything that I showed you so far is summary results, how much fixation on eyes and on mouth and on body and on object over a period of time. But as a clinician, I can tell you that the greatest challenge for our children, adolescents, and adults is what happens on a moment by moment.

The greatest challenge is a naturalistic environment, is when they are in their classroom or where they are in situations in which very quickly they need to respond to what's happening around, and they don't have that intuitive sense of the other so that they can adjust very, very quickly.

So that's what we need to measure. And this is what our children are exposed to. This is what helps them become socially competent, communicatively competent, and learn about the world because we learn a great deal about the worth through others, and that's an avenue that is significantly blocked for so many of our children.

But how do you measure what children are learning from that stimulus? So we have to develop some methods here, so imagine that there are 30 frames per second, okay, of video, and this is that frame that you just saw, and very, very, very, very quickly. This equation here is basically the distribution of photoreceptor cells in the eye, and it's basically the amount of visual resources that one individual is basically dedicating to that spot of that screen at that moment in time, okay? And because those visual resources, they translate into cortical magnification, we're really talking about how much brain is dedicated to that spot of the screen at the moment in time, okay?

So now, you're looking at many individuals, and as those individuals, they come together with those equations, you have an additive effect. And the hotter color means that now the group is

actually focusing on that spot of that screen at the moment in time. And we are now measuring the way that group is looking at the video.

Now, let's take really a bird's-eye view, and what we create here is basically what we called a map of relative salience. Now, this is the video screen, and what you see here is that there is a hotter color. It means that a greater number of children are focusing on that spot of the screen at that time. And now what you have, you are looking at the same video that you watched before, but through the eyes of 35 typically developing toddlers.

And you see what is happening. We can actually both spatially and temporally -- something really important happened here. So my colleague, Andy Meltzer, called this a hot spot, a hot spot of socialization because all the children are focusing at that spot at that moment in time.

Now, if we take another look at this, and this is now timed, and remember that there are 30 frames per second, and now we carve out that relative salience, what you have is a three-dimensional distribution, is a three-dimensional distribution of space over time and those colors each one is

basically quantifying what is really a statistic.

The moment that you get very red is because at that moment in time, there is what we called an attentional funnel. When there is nothing important happening, people are looking at different places on the screen, but that moment in time, the whole group converges on that spot on the screen.

And so, this is our statistic, this space/time distribution. And now you can watch this video from the standpoint of knowing what are the bits and pieces that are really critical for socialization. I think you got that idea.

Now, one thing that we found out that was really amazing to us is that typically developing 2-year-olds spent 80 percent of the time looking at that video in the same way, looking at the same spot at the same time. So this is called enculturation. We call this entrainment because, again, it's nature's solution to bring us all together so that we share a common framework of experience, okay?

And here now is an attentional funnel for typically developing 2-year-olds for that frame, and these are now scanned past for children who have autism. And you see how divergent they are.

This is what typically developing toddlers are paying attention to, and this is now what our children who have autism are paying attention to. It's a divergence. They're looking at the same thing, but their brains are learning about something very, very, very different.

Now, these basically are experiments that happened within the context of a 5-minute video.

And so, this is what happens when -- these are now typically developing toddlers, and this is what happened with the toddlers who have autism. See, there's a happy ending for that story. But look, these are the typical children, and this is what they are focusing on. Our children are all over the place. They have the same -- they watch the same thing. Their brains learn about something very, very different. And that divergence doesn't happen only in our 5-minute experiment. It probably happens at every wakeful moment of their lives. So when we are talking about reciprocal social interaction as a problem for brain development, we need to remember that, okay?

Now, when we use this as a new measure -- we call it a measure of relative entrainment -- those spots here are the children who have autism

relative to the normative attentional funnel, and this is what happened. What happened is that this experiment was done when children were 24 months of age, and then we saw them again at the time that they were 40 months of age. And those experiments not only predicting how autistic they were at the time that the experiment was conducted but basically one and a half years later at a higher level of prediction, because this is a measure of social learning.

We can predict the way they're going to be because we are driving what they are learning about the world. And if we can predict one and half years hence, we can intervene now.

The reason I decided to show this to you is because one of the grave problems that we have in clinical trials is that we can't quantify social disability. So this is work that we have been doing as adults, and we have the same space, time, distribution. Okay? They don't watch toddlers. They watch something else. A little more complex, highly charged videos. But this is what we are aiming at. Here is basically the typical distribution, okay?

Typical adults watching this movie. So let's try and ultimatize a measure. We just went past

what we called an attentional funnel. So let's find it. It's right here, okay? And what you're going to see is this statistic here in a different form, so this is the curve that we have for what happens here for typical individuals.

This is one individual with autism -- one individual with autism. Now it's a different sample of typical individuals, and it's basically the same. And now let's see a group of adults with autism, and it's quite different, and this is one measure. We have tens of those measures in those videos. So this is how quantifiable those measures need to be.

How much time? Five minutes.

Dr. Insel: We're 10 minutes past.

Dr. Klin: Oh.

Dr. Insel: So you'll need to wrap up.

Dr. Klin: I need to wrap up. So remember that slide. I'm so sorry. I get excited about stuff.

[Laughter]

Dr. Klin: Remember Joseph LeDoux said, "Brains also become who we are," that early social experiences are the platform for development. And here is our major issue that we need to address. Two slides. I'm not going to give you more than

that.

We need to work with the community. We need to augment the capacity of the community. The three factors for us to make possible community-viable solutions to improve access to care for young children who have autism is by working with families, with the medical home, and with those who are mandated by the government to provide those services to the early-intervention providers. Those are my colleagues who are working on that.

There was a creation over the course of years by Amy Wetherby and now sort of empowered by us, of highly interactive computer web-based to train individuals not only on how to identify the condition early but also how to provide supports to families and how to deploy the formal treatment that is going to make sense.

And I'm not going to -- I'm just going to wrap up with one slide, which is this. The whole idea here is that we need to teach those skills. Our children are diverging from typical experience every moment of their lives. We know that we need to provide highly intensive interventions. They need to reach maybe the level of 25 hours of week.

So it's a problem if those interventions can

only be delivered by experts. We need to capitalize on every moment of their wakeful lives.

So who spends all the time with those babies? Well, the mothers, their caregivers spent time. And so this whole process here is to support families, to coach parents, to basically create situations in which those skills are taught to their children and those skills are taught to their parents, because we need to potentiate that platform for development that happens every day in their lives.

Our goal is not to cure autism. I think that -- I know so many people who have autism who have incredible -- made incredible contributions to society, and they populate some of my favorite departments in some favorite universities. The issue is to transform autism from something that is a disability for so many families, for so many of the children, adolescents, and adults that have worked for the past 23, maybe over, years, to an issue of diversity. That's what we want so that we have an engineered society in which those individuals can really fulfill that promise. Thank you very much.

[Applause]

Dr. Insel: Well, I think there's too much here

to go on without at least a little discussion. So let's take 5 minutes for conversation. Let me just start off by asking whether we can co-opt your final quote for whatever we do for the next phase of our Strategic Plan, because I think a lot of us have talked about precisely that kind of vision, to go from a focus on disability to a focus on diversity. It's very exciting. Thank you. It was a really wonderful presentation. Comments? Noah?

Mr. Britton: Dr. Klin, that was excellent, and your data are fantastic. And I'm wondering if you still believe something I called you out on 9 years ago, which is that it is the movement of the mouth that directs children's gaze away from eyes as opposed to being internally opposed to eye contact in itself.

Dr. Klin: We have actually -- NIMH has funded a couple of R01s to address your question. So I will address a little bit. For many of our children, what we're finding out is that when very, very early on the eyes don't have that much value, it becomes an aversive sort of stimulus over time when we, people like me, try to engage the child with something that doesn't make any sense to them. So this is acquired in that manner.

But there is the issue of the audiovisual synchrony. It's really a distracter for our children. And one of the things that we have been working on, one of the R01s is to engineer an environment in which we can try to remove or at least alleviate some of the distraction and then potentiate the salience value of eyes for our children.

But, you know, it's a little more than simply trying to get our children to look at people's eyes. This is a reflection; it's a window into something that is happening internally. So we work -- we have those eye-tracking tools primarily because it's easier to do this research, but you have to think much more as a whole body.

Mr. Britton: Yes. I think we're moving the noise, and the visual environment is probably not going to impact that. But I'll be interested to see your results. Thank you.

Dr. Insel: Other comments? Can I ask you something very quickly, Ami? One of the things we've talked about in this Committee is the necessity of moving from group means to individual data if we're going to be able to make any of this actionable and actually take it into the clinic.

Where are we in that process as you look at the visual attention, eye-tracking work?

Dr. Klin: Well, as you saw, the moment that I tell you that we're trying to develop this measure as a measure for treatment effects, it has to be in the visual. And so, in all of the research that we've been doing, we are not reporting simply group means and in fact, you saw some of the sensitivity and specificity, some of that work in trying to separate those distributions.

We believe that we're going to learn a tremendous amount by following individual children. And so if this is an assay and that assay is basically signaling the unfolding of a condition, there are two things that are critical from that measure -- the timing of the disruption and the amount of disruption -- because that will give us in a way a sense of where we should focus from a biological standpoint.

That inflection point that I mentioned to you for those 12 children that started with mean decline eye contact, and you see that there is a course correction. It was very exciting to see that we could pinpoint the development transitions because now I can work, and my genetic colleagues

as well as my neuroimaging colleagues. And we have very specific hypothesis for those transitions. So that's why we believe we need to go forward.

I know that people have mentioned -- I think it was my good friend David Ledbetter, that if you study 15 children who have autism, you're studying 15 different conditions. I understand that, but the fact is that there are many more than 15 conditions, and somehow they come together in disrupting normative social development. And each one of those deviations give us a clue of what to perceive.

So we are very, very, very keen on the individual data, not only for the children who become affected. You know, one of the greatest questions of our time is how come three out of five children do not develop autism even though they might carry a very similar genetic liability. If we answer that question, we will be making a tremendous impact in this field.

Dr. Insel: Thank you. Okay. I think we're going to need to move on, but I really appreciate your being here and taking us through some of this exciting work.

We're going to hear next from Dr. Mark Leddy,

who's coming to us from the National Science Foundation where he's Program Director in the Division of Human Resource Development in the Directorate for Education and Human Resources. We call that EHR.

He manages NSF proposals and awards for three programs: research on education and learning, the EHR core research, and the Alliances for Graduate Education and the Professoriate. He's also managed past awards for the Research and Disabilities Education Program. He's received a number of awards himself, and prior to coming to NSF in 2006, he was an Associate Scientist at the University of Wisconsin-Madison where he was Director of the NSF-funded Alliance for Students with Disabilities in STEM, which is science, technology, engineering, mathematics education.

Delighted to have you here, and a chance to hear a bit about what NSF is up to with respect to autism.

Dr. Mark Leddy: Thank you very much. It's a great pleasure to be here. NSF has asked me to be the liaison to IACC, and I'm very pleased to do so.

We have been reviewing a number of items in your portfolio and contributing to the portfolio,

and we're very excited to share with you what is NSF, what is our agency because I don't think everybody is as familiar with NSF as they are with NIH. My own career began at NIH. I was a clinician before I was a scientist before I was an administrator. I am also the parent of a child with a disability and very familiar with autism spectrum disorder.

The current strategic plan for the National Science Foundation that covers Fiscal Years 2011 through 2016 includes a vision that paints an inclusive picture of the future of science, engineering, and education in a diverse Nation, and challenges NSF to set very high sites for ourselves. That vision is that NSF envisions a Nation that capitalizes on new concepts in science and engineering and provides global leadership in advancing research and education.

NSF was founded -- was created in 1950 -- by an act of Congress and signed by President Truman. When that law went into effect, which to promote the progress of science, to advance the national health, prosperity, and welfare of our Nation, and to secure our national defense, it was really created to initiate and support basic and

fundamental science research. That was the primary purpose. Additional purposes, though, were to create programs to strengthen the research infrastructure of our Nation and also to fund science education programs at all levels throughout the country.

At the time we were -- it was enacted in a way that would allow us to award scholarships, not just research grants but scholarships and fellowships to students and to foster international science. A key component was to provide a central clearinghouse for data on science and engineering and to inform policy information, and today we still do that quite extensively.

So sort of in a nutshell, here's the overview to get you more familiar with our agency. We are an independent Federal agency with an annual budget of about $7 billion. With that money, we support about 20 percent of federally supported fundamental research at U.S. institutions of higher education.

We are a grant-making agency. We do not have research labs. We do not have intramural facilities. We are extramural funding for the most meritorious research that's being done in this country in basic areas of science and engineering.

It's important for you to know that we cover all areas of science and engineering research, as well as education about, and I will use the term "STEM" repeatedly, which means science, technology, engineering, and mathematics. So we fund basic research and fundamental research about STEM education as well at all levels.

Please realize this is a very important issue for us, and many phone calls do I answer where I have to say, no, we do not support clinical research; please call our colleagues at NIH. Let me see if I can help you find the right institute to call. We do have some medical research taking place, but it's basic biomedical and medical engineering research. So we are not clinical. We are all areas of STEM, but we are focused primarily on those basic and fundamental science areas.

We have a discipline-based structure, a little bit like NIH does in terms of the institutes. Our groups are called directorates, and I'll review those in a moment. We have some cross-disciplinary multi- and interdisciplinary opportunities for funding as well. We use grant mechanism and a very strict merit process -- that I'll review quickly -- and primarily involve experts to advise program

officers, and then program officers make funding recommendations.

So here's a snapshot of our organizational structure. NSF has two leadership components. We have a Director of the Foundation, who's responsible for the programs, the budgets, the operations, the merit review process, and we have a 24-member National Science Board that establishes overall policies and procedures.

Both of these, the National Science Board, the Director, and the Deputy Director are all appointed by the President and have to be confirmed by the Senate in order to serve.

We then have the Director overseeing each of the directorates, and there are seven directorates in yellow here. The Directorate for Biological Sciences, or we call it Bio, the Directorate for Computer and Information Science and Engineering, or CISE, the Directorate for Education and Human Resources, where I work, EHR, the Directorate for Engineering, ENG, the Directorate for Geosciences, GEO, the Directorate for Mathematical and Physical Science, MPS, and the Directorate for Social, Behavioral, and Economic Sciences, or SBE.

We also have an Office of International and

Interactive Activities that is part of the Director's office that funds the multidisciplinary, interdisciplinary research that takes place.

Each of these directorates has an assistant director who oversees the work and the support for funding in those fields that are associated with the directorate, and then each directorate has divisions and programs within those divisions that support specific areas of research.

This is an overview of the timeline of our review process, and it's fairly detailed. If we start off on the left, we have NSF announcing the opportunities to the public. And it's typically a 90-day period of advertising that we are welcoming proposals. We do not call ours RFPs. We call them solicitations, announcements, and descriptions, and dear colleague letters.

The community then responds by submitting proposals to FastLane, which is our system, or grants.gov. These then proposals then come to the program officers. We as program officers then decide how these will be reviewed. Are we going to use ad hoc mail reviews? Are we going to run virtual panels of experts? Are we going to bring panelists to Arlington, Virginia, where we're

located, and have them review in-house? Or what combination of those will we use? It is typically a combination of face-to-face or virtual panel review with some ad hoc or mail review. There is sometimes only internal review conducted by program officers depending upon the nature of the proposal.

After those expert reviews are done -- so we're bringing in professionals who are experts in their fields to give us their opinions and evaluation based on our merit criteria for what is meritorious -- they then tell the program officer what they think is the better research, and the program officer does an analysis of their review and does their own review of the proposal and then makes a final recommendation to a division director.

A division director then makes a final recommendation -- yes, we can decline this proposal, or, no, we'll refer it to our Division of Grants and Agreements or DGA. Division of Grants and Agreements makes the final decision on all awards. So we recommend them as program officers.

Division directors agree or disagree. It goes forward to the Division of Grants and Agreements. It eventually goes to the organization for funding.

This is really about a 6-month process for review, and we work as hard as we possibly can to stick to that 6-month period.

I will mention that we have repeatedly been identified internationally as having one of the better merit review processes. The proposers are -- do not know who has reviewed them. The reviewers are kept blind, and so they are not aware of who the reviewer is.

So just some quick stats on what we do sort of on a yearly basis. In the past Fiscal Year 2013, we had about 50,000 proposal actions, and we had for those actions we had about 250,000 reviews produced by about 50,000 reviewers. We awarded about close to 11,000 awards at a 22-percent funding rate.

That's fairly typical for us; 10,000 to 11,000 awards are made on annual basis. And they are made to typically U.S. universities and colleges, although there's quite a range of types of institutions to which we make awards to. It's very rare that we support foreign organizations or other Federal agencies, but we do support a number of nonprofits and for-profit organizations as well as State, local, and educational organizations.

What might be of greater interest is what are

our activities related to autism. So we do not have an autism research program. We do not have any specific autism initiatives. And we do not, as I've said, support clinical research. We're not a member agency of IACC, although we're very interested in interacting with the IACC. And we do fund a limited number of awards that -- where autism is a component of the research.

So we support some basic and applied science projects that encompass topics that are related to autism spectrum disorder. They're in our neuroscience, our cognitive sciences, our research and disability education portfolios. We'll also find them in our computer simulation work that we fund, the robotics technologies that we fund where there is the potential for there to be some kind of broader impact in the future for people with autism.

I think it's important to remember that NSF sees itself, and always has, as a place where discoveries begin. We start the basic work. It's then often picked up by other people and has a much broader impact down the road as additional research is conducted.

I'd like to give you a few examples of some of

the projects we are funding. These are in the IACC portfolio right now, and you can find out more information in the IACC portfolio that's on the web. But this example, the Collaborative Research: Project Computational Behavioral Science: Modeling, Analysis, and Visualization of Social and Communicative Behavior, is led by Jim Ray, a professor and researcher at Georgia Institute of Technology. This is a multi-institutional effort.

It involves a large group of researchers at many different -- at several different -- universities. And they want to develop a new science and technology and behavioral imaging field.

And so what they are doing is they're capturing and analyzing social and communicative behavior using newly developed multi-modal sensing technologies, really much more basic research. But the intent here is that they hope that their work will then support studying and treating developmental disorders like autism. So the more basic work with the potential down the road to inform additional studies.

Another example is some of the work by Rebecca Saxe at MIT, who also has funding from NIMH, also

has funding form the Department of Education, Autism Speaks. A number of different organizations fund her work. This was funded by the Division of Behavioral and Cognitive Sciences at NSF in the Directorate for Social, Behavioral, and Economic Sciences, and it's one of our career awards. These are usually early in someone's career.

She's studying typical and atypical development of the brain regions for theory of mind, a little more closely related to some of the things that we think about when we have an interest in autism. She has specifically identified the right temporal/parietal junction, a very specific region of the brain, claiming that that's where people think about thoughts, and that’s where people think about other people's minds. If you haven't heard her TED talk, I would you advise you to take a look at it. It is really quite fascinating.

And Rebecca is doing some great work and is comparing the performance of typically developing kids with children who have autism, with other children who had delayed development of language, such as deaf children of non-signing parents, and looking at that area of the brain during certain

cognitive social tasks.

The potential here is very interesting for identifying brain activity that's specifically related to theory of mind and potentially leading to interventions down the road.

A third and final award example is predictors of success in postsecondary STEM education and employment for students with autism. This is a project funded by the Division of Human Resource Development in the Directorate for Education and Human Resources, and that I actually have the pleasure of managing.

Jose Blackorby and his team at SRI International on the west coast and Paul Shattuck, who is now at Drexel University -- a recent change -- have been -- proposed a study to look at a base of factors that were associated with postsecondary education and initial employment experiences for young adults with autism in STEM fields. They started by analyzing some data that existed in the National Longitudinal Transition Study from the Department of ED, and recently published findings that suggest that students with autism spectrum -- who have autism spectrum disorder, who are on the spectrum -- had the highest STEM participation

rates in college than any other students with disabilities.

So when comparing students with autism to other students with disabilities, in STEM, we're going to find a higher number of people with ASD.

Thirty-four percent of those students are likely to go into a STEM major. This may be something many of you all thought for a long time, but we really haven't had the evidence to say it's true.

So we've all, who have worked in universities, said, oh, we think folks in our lab or in our department maybe on the spectrum even though it may not ever have been diagnosed. But we didn't actually have that data. And there is a huge number of students with autism entering postsecondary systems right now. Our institutes of technology around the country are having very high enrollments of students on the spectrum who are pursuing STEM degrees.

We wanted some data, though, to say do we have any survey information do we have any hard evidence that this is really the case? And maybe not surprising, but if they enroll in a STEM major, they're more likely to go into science or computer

science.

Those are just three examples. There are a number of examples that you can see in the IACC portfolio that's available through the web. You can also search the NSF website. We have a very simple search engine. You can type in the word "autism" and get quite a bit of information.

Recently in November, and I think you might've talked about this earlier today, the GAO report on Federal autism activities. We've talked about it a lot at the National Science Foundation. GAO identified that NSF had funded 29 research projects related to autism between 2008 and 2012. For us, that is a -- we are pleased with that contribution, but it is -- fairly small given that during the same time period we made 55,000 awards for basic science and engineering research. So there is some contribution, but it is probably fairly tiny.

And with that said, it is our pleasure to continue to provide information to IACC and to give information for portfolio analysis and to provide whatever information we can to the Committee and to also gain information from the Committee as well.

I thank you for your time. I hope that has been helpful. And I am glad to take any questions

if you would like to pose them.

Dr. Insel: Thank you, Dr. Leddy. Questions or comments? Scott?

Mr. Robertson: I had a question and a comment. The question is, is there a possibility for -- space for -- more active engagement on autism from NSF over time? I mean, is that something that can grow, or are there limitations and constraints that if it's 29 studies right now, it's going to be 29 studies, you know, 5 years from now.

Dr. Leddy: We respond to what are the most meritorious proposals that come to us. So if we are inundated with those proposals, you're likely to see that number increase pretty significantly. If they don't come in, then they don't come in. We are responsive to our research communities. If our community is saying -- and if the stakeholders say to us -- you need to focus on this more, my guess is that the agency will be very responsive to that and will listen to those stakeholders.

I can tell you I for several years ran the Research in Disabilities Education program, and it merged recently with some other programs and is not called Research on Education and Learning. I would say on a weekly basis I get a call from a

researcher who wants to study autism. So I think the question is, is their study clinical, or are they looking at a more basic research study?

Mr. Robertson: And that depends on which funder they're going to go seek funding from.

Dr. Leddy: Correct. So sometimes I send them to NIH or Department of Ed, and other times I say please, please, please, we want your proposal, send it to us. That's basic science. We want it.

Mr. Robertson: And then the other just quick comment was on the STEM study, and maybe I don't remember the findings that well, but I think that there was -- the other side of it was while the participation rate was high, I think they found, unless I'm thinking of other research, was that the, I think the students weren't necessarily completing programs that well. The graduation rate wasn't that great. Am I remembering that wrong or no?

Dr. Leddy: What they do know is that they're one of the groups that's least likely to go to college. So if they go to college, they're more likely to enroll in STEM; but you've got it -- they're less likely to go to college. They're one of the lowest groups of students to go onto

college.

Mr. Robertson: Okay. Thank you.

Dr. Leddy: Which is a concern for us to study.

Dr. Insel: Idil?

Ms. Abdull: Thank you for your presentation first. And I have a question and a comment. The question is you said earlier that you've funded only 29 studies, but then you get proposals you send them to NIH. So are you looking for a specific proposals in case people are listening, researchers? What should they be sending to you?

Dr. Leddy: Right.

Ms. Abdull: And then my other -- I'll just ask all at the same time. The other question/comment is you said you have an Office of Diversity and Inclusion. What do they do, and what would you say, out of curiosity, is the diversity of your organization?

Dr. Leddy: Good question, thank you. Good questions. So the proposals don't come to us and then we send them to NIH. What'll happen is people will typically call us or email us in advance and say the study I'm proposing, or here is the work I'm interested in. And then we'll try to give them feedback during the write-up of that proposal.

We want more basic, specifically in the area, I am in educational research -- we want more basic educational research -- typically that's going to contribute to theories or models of education. That is what we are looking for. In the other fields, it's going to be more basic science and engineering, and it frequently has an indirect relationship to autism.

Although actually on our web right now you can find a great video by something that was funded by the Directorate for Education, where they're developing robots to interact with individuals who have autism. But again, that's basic development of the robot. They are engaging a psychologist, who knows about autism, but it's autism-related or autism-focused, but it may not be exactly the same as what we think of for some of the other clinical research NIH is funding.

The Office of Diversity and Inclusion is primarily for servicing the public and for the employees of the Foundation. We have a very diverse workforce. There is about 2,100 employees of the National Science Foundation, and last time I looked, there was a very large percent of individuals with disabilities, upward of more than

25 percent citing a disability.

Ms. Abdull: So would that be 25 percent of employees at NSF have disabilities? And then my specific question was, if you keep track of racial and ethnicity in terms of diversity, and if so, what that percentage is.

Dr. Leddy: So that information is kept by the Office of Diversity and Inclusion, and I would have to ask you to refer to them. We do also keep that -- we request that data from the investigators as well. I cannot release a lot of that data, and they do not always provide the answer to those questions. We also ask the same information of our reviewers, and a lot of our reviewers have the option of not providing that information, too. So we have it. We all know that we know to question somewhat how accurate that data is.

Dr. Insel: So just to go back to your first question, Idil, because it refers back to what we talked about this morning. I said that the funding agencies like to stay within their lane generally, and the lane here for the most part is pretty clear. As you've just heard, NSF is basic-basic science; so for social and behavioral research, it would be very basic.

Rebecca Saxe, who you just heard about it, may be study social neuroscience, and the NSF project would likely be doing theory of mind in healthy undergraduates, and the NIMH project might be theory of mind in adults with an ASD diagnosis, something like that. So that's often the way that even the same person could be funded by both agencies with a somewhat different focus.

Having said that, there are places where the agencies say, you know what, this really is of joint interest. And so what we do -- and we've done this on computational neuroscience -- is we have a joint announcement. We have a joint solicitation, a joint review. And then when all of the applications come in, we make a decision between us about, you know, this one is probably better served by your program, this one by ours. But it's a very fluid effort.

And I think the community wins because both are involved, so it really depends on the area. In this case, with just the 29 projects that are mentioned here and with the few that come in through the portfolio analysis, there's really not enough yet to make that worth a joint effort. But you can imagine someday it would be.

Ms. Abdull: If I could just add in terms, because we talked about GAO, if we all -- if we're staying in our lane, then that eliminates the duplication. If we – at our response -- each agency is doing a good job in staying in their lane, then there isn't duplication.

Dr. Insel: Yes. Each of the agencies has a somewhat different mission.

Ms. Abdull: Right.

Dr. Insel: But there are places where we become jointly interested in problems, and computational neuroscience is just a great example of how that happens. I don't think that's really duplication's coordination in that case.

Ms. Abdull: No, I know. I'm just defending us a little bit and saying that we are not duplicating because we're all staying in lanes and we all have specific things that we fund and research and a reason why we do that. So as Alison writes that draft --

Dr. Insel: Okay. She's taking notes. Any other comments for Dr. Leddy?

[No response]

Dr. Insel: Okay. Thank you very much. Very helpful.

Dr. Leddy: Thank you all.

[Applause]

Dr. Insel: We're a little bit behind schedule, but these next two items, at least the second one, is going to be compressed, so there's not that much. We'll catch up here.

Dr. Insel: We had two issues for Committee business. One is Geri is going to take us through the DSM-5 Planning Group update, and the second is Susan is going to take us through very quickly some issues on OARC business. So, Geri, do you want to start?

Dr. Dawson: So as you may recall, there was the decision that we would form a planning group -- I think that's what we called ourselves, a planning group, right -- to consider both, the policy and practice, as well as the research implications of the changes in the *DSM*.

And this was really in response to the community and concerns discussed in the Committee as well as feedback from the Committee to the IACC about the potential implications of the changes both in the area of research and policy and practice.

So if I could have our first slide. Oh, I have

it here. Okay, perfect. So, first of all, you probably have trouble reading this, but we had a number of people from the Committee, but we also have made a point of inviting outside experts to be involved in a series of conference calls that we held. So our outside invited experts included Laura Carpenter, as well as Diane Paul in the area of speech and language. We also invited Susan Swedo, who was the chair of the Workgroup on Neurodevelopmental Disorders, and Amy Wetherby.

These are folks who are either on the Committee itself or have particular expertise in the area of diagnosis and early intervention.

And we had a number of phone calls where we discussed what was the charge and we finally decided to break it down into two kind of subgroups, one focused more on research implications and the other on policy and practice.

There is a draft of a statement that we wrote that was then -- had iterations and circulated among the members of the Planning Group, and it's not a final document. I think it's a document that this Committee needs to look and respond to and decide that this -- you know, if it needs to be still further revised.

But the idea was to have a document that at least described what some of the issues so that as people think about going forward, what needs to be done, in the area of policy practice or research, you know, the IACC had kind of weighed in on this. So I'm now going to turn it over to Cathy Rice. Is she here?

Dr. Catherine Rice: Yes.

Dr. Dawson: So Cathy really headed up the section on Implications for Research. So, Cathy, do you want to walk us through some of the points that are described in the document?

Dr. Rice: Okay. Good afternoon. So in terms of the research discussion, we had a very lively discussion, I think. Lots of good points brought up. So trying to condense the many points that people brought up that may be important implications of the change in criteria that really did require very thoughtful systematic research.

And so, in reference to the way the IACC's Strategic Plan has been framed in terms of questions that may matter to the community of people affected by autism, we took a similar approach in terms of research questions. Starting with what is the impact potentially on who is

diagnosed using the *DSM-5* criteria both for autism spectrum disorder and, in addition, for social communication disorder, a new communication disorder that's been added with some questions that we've discussed on this Committee about what is the potential overlap with autism spectrum disorder, even though it's in the communication disorder lane.

Also looking at, you know specifically the reliability and validity of the criteria, and the specific components. What about some of the new features that have been added, such as the severity ratings? Adding specific specifiers -- what does that tell us or not tell us?

In terms of differences in who is identified both in terms of clinical community as well as prevalence estimates. What are findings both for those individuals that are clinically referred as well as when we do a broader population-based prevalence approach? Who may or may not be being picked up differently based on the updated criteria?

Then another important area is how are people diagnosed -- so what changes may be needed and actually the mechanics of how diagnosis occurs. Are

there changes that may be needed in screening and assessment tools? Particularly, how can SCD, social communication disorder, be assessed? We don't really have tools that are geared specifically toward assessing social communication disorder.

And also, what's happening within the community? With *DSM-IV* in 1994, we saw a big sea change in the way autism was viewed, going from a more focused view of autistic disorder to a broader inclusion of the spectrum. Will we have any kind of sea change in terms of concepts of autism, thinking about the subtypes as autism spectrum disorders? How will that be different among clinicians and community members, families, as well as researchers and people on the spectrum?

And how will the criteria actually be applied? Will it have an impact on service system? So these are diagnostic criteria, which are different than eligibility criteria for service use. But will it have an impact? They often inform each other.

And then finally, what does it mean to be diagnosed with ASD? The Work Group had a lot of discussion about the importance of considering what does this mean for families and for people on the spectrum, particularly the issue of does the

removal of the subtypes -- how does that impact individuals -- particularly among those who may identify with a community like Asperger's disorder and having Aspie communities. Will that go away? Will that change the resources and connections that those individuals feel?

And how will some of the features, like severity level and specifiers, be used to actually inform services and supports? Does this help us by saying, within social communication, within restricted and repetitive behaviors we're going to characterize in general the level that this person may be functioning? Does that actually lead us to more informed intervention decisions? And then back to the basic question about will the way that services are qualified and provided actually change? So those are the primary items.

Dr. Dawson: In terms of the areas or the key issues, and practice, and policy, this is not a comprehensive list of all the issues that are discussed in the report, and I've felt that given the amount of time that we wanted to devote to this, that would be a bit much to cover. But these are some of the key issues that are identified in the report, and I really encourage you to read it.

And we should decide on a process for finalizing it in terms of getting your feedback, whether it happens in discussion or through email.

But the key issues included the issue of using the severity ratings to prescribe services. So the people on the DSM Working Group really made a point that we are not at a point where we should be using those ratings to say this child qualifies for, say, early intervention and this child doesn't. For one thing, people haven't been trained on how to make, you know, these ratings. We don't how reliable they are. They haven't really been anchored to specific kinds of behavioral observations.

So there was concern on the part of the Committee that people would prematurely begin to be making decisions about services based on the severity ratings and that that was really premature. So we made a recommendation that that not happen, as yet.

And then a second issue had to do with the fact that there still are really few prospective data on the reliability and validity of the criteria for very young children, for individuals from diverse ethnic backgrounds, and for adults.

And so we made a recommendation that -- as

clinicians move forward, and researchers, too, but particularly in the area of policy and practice -- that when we translate these into the real world, that we have to keep in mind that we still don't know a lot about, you know, the validity of some of these in these other populations. And so, it's just a word of caution, right, not to over-interpret and to be careful.

And one of the issues related to that is that, as I think Ami pointed out, autism develops over time, and symptoms emerge over time. And there was some concern that during that very early period that a child who, in fact, may have autism may not be showing all of the symptoms.

And that child, if you were to interpret your diagnosis as prescriptive for early intervention, may not then qualify for early intervention.

And, in fact, there were folks on the Committee who were very much involved in policymaking around early intervention and birth-to-three services. And, in fact, that is starting to happen already.

And so, there was concern about this idea that -- and you can read it in the report -- the recommendation that intervention services should be

made based on need, and that individual challenges of each unique child rather than using a diagnosis to just say yes or no, particularly around these young children who, in fact, may be some of the kids that would benefit most as the symptoms begin to emerge.

A fourth issue is that the *DSM-5* really is a very different tool in many different ways than the *DSM-IV*. And I think clinicians will naturally use some of the processes that we used for *DSM-IV* and try to kind of retrofit them or something onto the *DSM-5*.

And that may result in us not taking full advantage of some of the really positive features. So, for example, you can make a diagnosis now based on your historical assessment of whether these symptoms were there early on, and so we have to be careful to make sure to do very careful history assessments now.

And in addition, in contrast to the *DSM-IV*, rather than prescribing or describing very specific symptoms, general categories of behavior are described where many different symptoms could actually qualify for that category or that criterion.

And so, Sue Swedo, for example, really encouraged clinicians to be reading a lot of the fine print that may not just be in the list, because otherwise I think we'll end up not really giving the diagnosis to a lot of people that might qualify for a diagnosis of autism spectrum disorder.

The next issue was that there is some confusion out in the community about this -- Do you need to requalify, so to speak, for a diagnosis of autism? Let's say you have a diagnosis of PDDNOS now, and do you need to go back now and get a *DSM-5* ASD diagnosis?

And so, we just made sure in the document to clarify that that does need to happen, that if you have a diagnosis on the autism spectrum disorder currently, that should qualify you for a current diagnosis, even though the system has changed.

And then the next issue that was discussed had to do with social communication disorder, and there was a lot of discussion about this, a lot of lively discussion.

And one of the things that was brought, I thought Amy Wetherby made this point very well, is that this is actually not a diagnosis that would be

likely to be given to a very young child, that you actually need to have quite a bit of language and then to be using that language in a way that shows that you have a lot of trouble with social communication and pragmatics.

So a lot of people have been misinterpreting social communication to mean you simply have everything but the repetitive behavior domains and that they might try to apply that to a very young child. And that, again, would end up with a lot of missed diagnoses.

But in addition, there are really no clear treatment guidelines for social communication disorder. So let's say you give that diagnosis -- so in contrast to autism now where guidelines are starting to be developed, there's a lack of clear guidelines.

So the recommendation was to come back to that general principle of making intervention recommendations based on the individual needs of that child and really the unique characteristics rather than saying, for example, okay social communication disorder, so they're not going to go into the early-intervention program. In fact, those kids may benefit from early intensive behavioral

intervention.

And then, more information is needed for clinicians and educators on the appropriate and reliable use of both of the diagnostic specifiers as well as the severity rating. So they're in there, but a lot of people still really don't know quite how to make those kinds of ratings and specifiers reliability, so we need more training and actually tools for those.

So those are some of the issues and recommendations. And I guess I would just open it up for discussion.

Dr. Insel: Well, thanks to you and the Committee, and thanks, Cathy, for sharing that with us.

Before we get into the questions, maybe others have the same confusion I do. On number one and number three, the first one says "use of severity ratings to prescribe services not appropriate." But the last part of number three says, "services should be based on need rather than diagnosis." What's the difference between saying "need" and "severity ratings?"

Dr. Dawson: Well, I think the idea here is that there should not be an overly literal

translation of a severity rating into qualifying for a specific kind of service. So, for example, let's imagine that a State decided that any child who has a severity rating of 2 would not qualify, but if you have a severity rating of 4 you would qualify for some specific service.

And so, the point here is that these severity ratings are general enough and probably unreliable enough clinician to clinician, and there really aren't any good anchors yet, and there aren't really good symptoms; that we don't want people using them in that kind of literal prescriptive way.

Now, obviously there's some relationship between how the severity rating and clinical need, right? But we just don't want to overly literally interpret it.

Dr. Koroshetz: Oh, okay. I don't know if that wording works.

Dr. Dawson: Well, you have to look at the report. So that's exactly the kind of feedback we need, so look at the report and see if you think we did an okay job in the report rather than my little slide.

Dr. Insel: Larry?

Dr. Wexler: If I could add to that, severity ratings are very tricky because under IDEA, neither your disability, your intensity of your disability, can drive services. Your need drives services. So it isn't the type of disability. And then if you add, you know, not every kid -- kids who don't have autism may benefit from ABA, for instance. I mean, it's that kind of thing. So we'll be very cautious about any kind of tiered --

I mean, it was like in the days of mental retardation or educable, trainable, profound. And that typically generated types of services that you automatically received. So I think that the caution is well taken for that.

Dr. Insel: So maybe if it's in the report, that's great to know.

Dr. Dawson: You have to tell us whether we did a good job communicating that in the report. That's the feedback we need.

Dr. Insel: Scott?

Mr. Robertson: You know, I think from what I have seen on the report, and I need to maybe look at it more thoroughly in the next couple of days, is I really appreciate the work and your leadership, Dr. Dawson, on this effort.

And I think it's very thorough, comprehensive, really covers a lot of things that were discussed in the Committee that are really, really important, major issues with this diagnosis criteria change that are really going to have a real impact, you know, not just on the research, but on people's lives.

And I really appreciate particularly some of the discussions on underrepresented populations, and lifespan issues are really -- like it hits home in multiple places in the document on those issues, which are a real major part of the change -- part of the implications and the change in the criteria.

So thank you very much for the work on this document.

Dr. Insel: Idil?

Ms. Abdull: I was wondering if there was a way, Dr. Dawson, when something is coming up to train. I could just see a lot of maybe misdiagnosis and a lot of States cutting services because it doesn't meet -- they're sort of at the other.

And I just wonder if there is something coming up to train people who are going to be using this to make sure that they not only give the right diagnosis, but they give the right need in order

for these children and people with autism to get the right services.

Dr. Dawson: Well, in the document we did talk about the need for training, and that was discussed in the workgroups several times. I do think in general, and, Larry, perhaps you can weigh in here.

But you know, these are kind of State decisions about how they interpret and use this information, and that's why we thought -- I mean, I don't know whether this IACC document will ever have any, you know, real-world impact, but I could imagine, for example, if it started to be misused, at least there's a document that is written by a group like this that someone could turn to and say, you know, actually these specifiers shouldn't be used to say that this child, you know, is supposed to go into their service and another. So we're hoping that it can serve that purpose.

Ms. Abdull: So a follow-up then. Could the Department of Education, I don't know, push maybe, because you do a lot of the diagnosis, even though States have power, they still have to follow the IDEA and the Federal rules.

I really just would think that we need good training of this because it can have a lot of

impact if children are not getting the right services at the right time for the right need. How do we eliminate that, at least from the education point of view?

Dr. Wexler: Do you have that answer? No, I mean, I'll pass the buck to a certain degree, you know. The Federal Government is not responsible for making sure that every diagnosis in the United States is correct.

And that being said, it is a State responsibility; you're absolutely right.

What we can do is put together, and I was just making some notes in terms of are there training resources -- that, in fact, we do have centers that produce training resources. I'm writing on one of their pads right now, which they give to me as swag as the funder, that produce free online modules and things. And that might be something that we can look at in terms of --

You know, the problem is I don't think we have answers yet. And, you know there's a lot of questions here, and so the training may raise as many questions as answer questions -- but as an awareness activity in the field, certainly amongst school psychologists, which is where I think most

of this will come. The other side to that is do realize in terms of early intervention and Part C, most States don't use any diagnosis, you know. So they're not labeling, and they prefer it that way, and most, most -- there's a lot of controversy over whether it's good or bad -- but most places feel that it's good. So they'll use a developmental delay label on kids that cover a whole spectrum of disabilities, so it's hard to say what they're being – why they're receiving services because of perceived disabilities or deficits, but not necessarily being labeled with a disability.

Usually our data would indicate just it's no surprise that the Part C population dramatically increases at around age 2, which is correlated with lack of language development.

Dr. Insel: Jan?

Ms. Crandy: I just wanted to say as a member of this Committee, I think the document turned out really well, and I appreciate the caution that you put in there. Some of the concern that I had was on the severity level -- funders deciding not to fund more severe kids. And so, picking, you know, the different pathway from, you know, not getting services to, okay, we're going to do the kids that

have lower severity because we have limited dollars, so let's put it where we can have that effect. So I appreciate the caution. Thank you.

Dr. Insel: Coleen?

Dr. Boyle: So, first of all, I appreciate the work that you did, and I actually think it's a great tool to have out there. And as you say, it really will provide reference to people who can use it hopefully within a number of contexts.

But I was thinking as I was sitting here, is there way that we could monitor the impact in a bit of real time? You know, with our ADDM Network, we're trying to understand how that changes prevalence, but there may be other ways we can tap into families and providers and trying to better understand. So I guess I'm urging those people who are around the table and thinking about the child surveys that HRSA runs, you know, are there questions that we can insert to get a better sense of what's happening?

Similarly, in the IAN Network, I had a lunch with the new principal investigator on that, you know. Are there opportunities to survey parents of existing children or adolescents? Again, trying to get a better sense of the real-time impact of this.

Dr. Dawson: Well, I like the idea of systematic data, and I would also be interested, if David Mandel is still on the phone, if he has any ideas about how we might do that.

I will say that Autism Speaks did -- on their web-site we have a survey that is -- you know, obviously it's going to be informal. But what we wanted to do, we developed a questionnaire that's pretty systematic about people's experience. So, for example, did you, you know -- were you required to get your child re-diagnosed, or did you have an experience where the *DSM-5* led to loss of a service that you were previously receiving, and, if so, what was that service?

And so we're trying to -- Autism Speaks now is trying to collect data on that. And I haven't looked at it recently, but I'd be very curious how many people have weighed in there. But you could take a look.

Dr. Boyle: And then just another idea following up on your idea earlier, Tom, of doing more qualitative research. You know, clearly we could be doing some focus groups and the different -- not we. Collectively, the agencies that are involved or the funders, the private funders, can

be doing some qualitative research to better understand the impact of this, not just sort of letting it happen, sort of giving the analogy of what FDA would do in terms of post-marketing surveillance and getting a better sense of what's going on.

Dr. Insel: Geri, I'd like some guidance on where we go from here. So it sounds like you're getting a lot of good feedback. People seem to really like this. There's the clock is ticking because this is an issue that's very current.

What would be helpful given we've got a nice document here? Would it be useful for the Committee to endorse it, put it on the website? Is it something that should be published? Should there be something at IMFAR to dig into this? What are your thoughts about where to go from here?

Dr. Dawson: Well, I'd be curious. You know, there were a lot of people around this table who participated on these calls, so I'd like to everyone to weigh on.

But I do think it would be helpful, unless people have read it and they think, oh, this is, you know, great the way it is. We might want to do one iteration perhaps through email. I know that's

hard, but, you know, there are places where it could probably be worded better. There may be places where it's not as clear because we talked about it, and now you're reading it with fresh eyes.

So perhaps if we could do one, at least, round of getting that kind of feedback. Then I just imagine it would be like other policy statements that we have created and posted on the web-site. And we could think about if there are some mechanisms for dissemination. And for our other ones, I don't know.

Dr. Daniels: Great. So then we could send this out for comment and get feedback from folks. So if we get comment and incorporate it, do you want to wait until April 8th to formally accept it and publish it, or do we need to convene the Committee earlier than that?

Dr. Dawson: Can we on -- we can't vote on it.

Dr. Daniels: We could if the changes are minor, if it's not a discussion that seems like -- you know, it sounds like right here, can we get a sense in the room from people, have you read it all, or had time to look at it, and you feel generally comfortable with it and think that it's

mostly going to be minor edits, because if it's minor edits, we can do it by email. If it's something that is going to be more meaty discussion, we would need to do it on the phone.

Dr. Dawson: Let's see what kind of feedback we get.

Dr. Daniels: Okay. So then, we could potentially, if it's small adjustments, then we could make them by email put it out for an email vote and then publish it.

Dr. Insel: Are people comfortable with that as a plan? Okay.

Dr. Daniels: Does that help?

Dr. Insel: Okay. And so, could we put a timeframe on that, maybe 2 weeks for feedback?

Dr. Daniels: Right.

Dr. Insel: Okay. By the end of the month, end of January, we'll get feedback and then figure out how to turn this around in February and if there is an opportunity at IMFAR or someplace like that to disseminate this.

Especially, Cathy, on your pieces on research, I think that's really important to get out to the field, to get people struggling with this in a more communal way rather than individually. Okay, very

good.

Ms. Crandy: Could it be disseminated through Part C, too, through Part C? Could it be disseminated through Part C also?

Dr. Wexler: Well, I would suggest it gets disseminated to the Infant/Toddlers, ITCA. That's the Part C lead agency directors. It should go to the National Association of State Directors. Special Ed -- I mean, we could help you with certainly the school psychologists. Yeah, we could get it to our parent training and information centers. I mean, we have a huge ability within birth to 21. After that, no go.

[Laughter]

Dr. Insel: Okay. Well, this is great. And thanks to all the people who worked on this and Geri for leading the charge here. And we'll turn this around in the next month.

Dr. Daniels: It would be helpful if various people around the table can help with that dissemination. For OARC, we'll put it on the web-site and send out our usual announcement to our audience. But I know that you all have a reach to other areas, so we'll count on you to pass it onto other people once we get it up.

Dr. Insel: Susan, what about OARC update?

Dr. Daniels: Great. So I have a brief update for you all about some activities that the Office has been working on for the past few months.

Just wanted to give you a little update on an upcoming report to Congress that will be coming out at some point in the in hopefully relatively near future. It's not a decision that's made within OARC.

But we are expecting to put out a report to Congress that we've coordinated with the help of many of you around the table at the various agencies. The report covers the activities, both research and services activities, of agencies and offices within HHS, the Department of Education, the EPA, DoD, and the NSF, who you heard from today.

And we do expect that it'll be submitted to Congress and released in this calendar year. It's safe to say that. And I can't tell you the exact date, but we hope by the next IACC meeting you'll get a hard copy of the report.

So I don't know if anyone has questions about this, but just wanted you to know what we've been working on. I don't have the new cover yet for the

portfolio analysis report, so I put the old cover on the slide.

But we are -- you've seen a preview of the data over the last few months as we've been working together on the Strategic Plan Update. So we have the data from 2011 and '12, and we've also compiled 5-year data.

And so, the new portfolio analysis report will cover 2011 through '12, plus a 5-year look, which will be basically summarizing some of the same things that we've looked at in the Strategic Plan Update. And those tables that we reviewed for the Strategic Plan Update will go with the Strategic Plan Update. And we do expect this to be out in this calendar year as well. That one is not as quite as far along because we've been working on the Strategic Plan and the Combating Autism Act report.

We also will be working on the new Summary of Advances. This is last year's cover again, but we are at the time now in January to look back over 2013 and choose the top advances. This is an activity that's prescribed in the Combating Autism Act that the Committee will on a yearly basis provide a report to Congress of the summary of

advances in research.

And so, the way that we've done this over the past few years has been to have the Committee choose the top 20 most significant advances in both biomedical and services research, and the publications cover prevalence, diagnosis, biology, risk factors, interventions, and lifespan issues, sort of mirroring the Plan.

And so, the process, unless the Committee has any changes from last year's process, what we did last year was we had each IACC member nominate up 10 articles, and if everybody actually did 10 articles, you'd have 300 articles to choose from.

So maybe -- but we know that a lot of times you have agreement on some of the best articles.

And so, we would put that list together. I don't know if you want to change the number at all of how many would be nominated and how many you might need to look at. And we will provide you with a list of all the papers from the science updates that Dr. Insel gives at the meetings from the last year. We have that list that we can send you.

And we will take all of your nominations and compile it into a ballot that you can use to vote. And we will do tiebreakers if there are some ties

in the voting. And once we've narrowed down to the top 20 articles, OARC will draft lay-friendly summaries of each article and provide you a draft document just briefly to review. And the hope would be to release it in April 2014 for National Autism Awareness Month.

So that is the plan, unless there are any comments from the Committee, if you'd like to do anything differently from how you did it last year. Walter?

Dr. Koroshetz: Yes. So I was just wondering whether or not people think that as we do this it would be better to get the prescribed way of doing it so there's balance among the questions or not. So now we pick independent of.

Dr. Daniels: Right. And in the past we've discussed this, and I don't know if the Committee wants to do that. In the past we've just taken the top 20, and it usually has ended up distributing across the Plan just because of the expertise we have around the table, although sometimes there were fewer articles in some categories than others.

But as Dr. Insel pointed out this morning, in the services area, there's quite a lot coming out, so I have the feeling that some of you who are in

the services field will have many nominations there, so we may fill out those areas better than in past year. Well, that remains to be seen.

But does the Committee want to try to do an even number of advances? With seven questions, that makes it that we'd have to do more than 20. Would you like to do 21, the read per question, or do you want to do it like the past where we just take the top ones and --

Dr. Insel: I'd rather just look for the best science and just see how it falls.

[Inaudible comment]

Dr. Dawson: Because then it also tells us something about --

Dr. Daniels: That's true. It is informative if you see a lack of activity in some area, although I have the feeling based on some of the science updates that we've been seeing that we won't see a lack of activity. Hopefully there's plenty there, and it looks like there is. So is this process --

Dr. Insel: Yes. Can you remind us how it works? So if there's an article that's electronically published but not actually published, do we count it in -- let's say it's electronically published at the end of December

2013, but it doesn't come out until March of 2014. Can we count it as a 2013 --

Dr. Daniels: We changed that last year so that we could do e-pubs too, because it started getting too far behind the times. I think technology has changed, and now people are -- the e-pub is when it gets -- hits the news. So we're --

Dr. Insel: Alright. So that means that something that was e-pub'd in 2012 in December would not qualify, even though the paper came out in January of 2013.

Dr. Daniels: Not necessarily, just as long as it was either physically published in 2013 or e-pub'd in 2013 --

Dr. Insel: So we'll open to that, okay.

Dr. Daniels: -- and doesn't repeat anything from the previous time.

Dr. Insel: Okay. Good.

Dr. Daniels: So if that sounds agreeable to everyone. So it sounds like we have a plan then for doing the Summary of Advances, and I believe that's my last slide. I know we're ready for our break.

Dr. Insel: Alright, we're actually ahead of schedule twice in 1 day. That's unheard of. But I still want to do a quick break so we maybe can

finish a little bit early. So let's take 10 minutes now. We'll come back at, oh, let's say, 10 till, which I know means 8 till. So see you in 10 minutes.

(Whereupon, at 3:41 p.m., a recess was taken.)

Dr. Insel: -- ninth inning. The game is not over until the last batter has had a chance. So I'd like to get everybody back to the table, and those who are on the phone, we're going to start the last part of the agenda, which I must say is one of the most important parts of the agenda in terms of our coordinating function. It is the chance to hear from everybody around the table about new initiatives, issues of interest.

And as we've done in the past, we wanted to feature a couple of topics that we go into a little bit more depth on, but at the same time, as I think you saw from Susan's note yesterday, this is really meant to be a round robin for anybody on the Committee to talk about a new initiative of interest.

So we're going to start with -- Larry Wexler is going to talk to us about PROMISE. And, Larry, do you have slides as well?

Dr. Wexler: No.

Dr. Insel: Okay.

Dr. Wexler: This will be a PowerPoint.

[Laughter]

So I'm -- your eye gazes are, you know, supposed to be over here. But thank you so much, and I'll try and move fairly rapidly.

So PROMISE is Promoting the Readiness of Minors in Supplemental Security Income. So what we're starting with is the supposition and the known fact that the outcomes for kids with disabilities are essentially terrible. I mean, and this is about all kids with disabilities. We know the unemployment and the incarceration rates of who move out of school are really dreadful.

So this is a collaborative program between the Department of Education, Social Security Administration, HHS, and the Department of Labor.

And it's been an unbelievable collaboration. And those of you who work in government agencies know that to be able to say that is a fairly rare occurrence. But I will say it's all our money, which has helped the collaboration quite a bit.

[Laughter]

And, you know, it goes both ways. So what this is really is about, first of all, in terms of

money, how did we find $200 million? You know, which is literally kind of what happened.

So just to give you an idea of where that money came is Office of Special Education and Rehabilitative Services, which is the umbrella organization, or OSEP is, Rehabilitative Services Administration is vocational rehabilitation. And they have a formula grant program of, I think it's about $2 and a half or $3 billion dollars right now, and it has a State match to it.

And frequently the States don't match, and the money comes back and goes to Treasury. And so that's where the money came from is instead of giving -- sending it out to Treasury, we're actually going to do something really productive with the funds. And they asked OSEP to take the lead on the project, and my group took the lead on it.

There was a project called Youth Transition Demonstration, which predated this, out of the Department of Labor, which was looking at the same things, how can we get better outcomes for kids with disabilities as they transition? And the problem with that project is it did not have the scientific rigor on which to draw any kind of

causal conclusions about it. And that's why PROMISE was really created.

So PROMISE, it's a model demonstration random controlled trial, okay? States are the grantees. The governor is the applicant. The leads and you have a chart that had the different leads that are doing it, frequently education, sometimes vocational rehabilitation. The States, they must come up with a minimum of 2,000 participants. It's a big study, and the 2,000 are randomly assigned to either a treatment group obviously or a non-treatment group.

They are not necessarily developing new treatments. It's mostly focused on braiding practices that we know have a research base for working. So examples might be work experience -- we know that has a positive impact -- benefits counseling, dropout prevention programs, evidence-based programs. No one has really ever put them together as sort of a braided treatment, and there are certainly more.

The control group just gets whatever they would normally get. So that was a big issue in rolling this out and creating this. Withholding treatment -- you know, may be able to do that in

drug trials, but, you know, and use placebos. We can't. We simply can't do it and probably wouldn't want to. So certainly the parents weren't going to put up with it.

The other thing that's really a major component of this is family. So this is about kids who are all on SSI, so this is about essentially kids who live in poverty. There will be -- when you talk about 2000, you're going to pick up kids with autism. It's definitely going to happen. Many of the States -- we concluded you needed 7,000 to 8,000 -- a pool of 7,000 to 8,000 -- to recruit 2,000 participants.

And many of the States that got the grants have little more than 8,000 kids on SSI, and frequently a bit less. So it's likely we're going to get a large -- you know a large, large group. And they will be identifying the disability of the kids.

There's a lot of moving parts to this, but a big part of this is the treatment, whatever that becomes in the State, is also directed to the family. That we took a position from the beginning, a recognition that kids don't exist outside their family. They come from a poor family. It isn't that

they are poor. And that there's a lot of -- you know -- there's a lot of implications for that. So how to address the needs of the family is just as prevalent and prominent in this as how to address the needs of individual kids.

These are 5-year -- well, we published it up to 5 years, but, you know -- why would you not apply for 5 years? Although, you know, the States are -- they can happen.

Mr. Robertson: Why would you leave $200 million on the table?

Dr. Wexler: What's that?

Mr. Robertson: Why would you leave $200 million --

Dr. Wexler: But, you know, people do strange things, you know. They'll say, oh, we only want it for 3 years, you know. We can't say no because it says up to 5 years. So these were competitive, multiyear grants for up to 5 years, and these are what we call model demonstration projects.

They're cooperative agreements. Those of you not in the Federal world, a grant is a gift. A cooperative agreement means there's an enhanced interest of the Federal Government in the activity.

The unofficial definition in my office of a

cooperative agreement is it means that they cooperate with us. So, I mean --

[Laughter]

I mean, we're giving them a lot of money, so we've got hope that they'll be receptive to our suggestions. Don't quote me on that one, okay?

So the targeted participants are child SSI recipients between the ages of 14 and 16 at the time the project services are initiated. So they could recruit 13-year-olds as long as they didn't start until they were 14.

We have a -- the Department of Labor -- we flowed money to the Department of Labor for an evaluation contract, so there's a national evaluator that is doing two things: essentially helping with the randomization and helping -- providing sort of assistance -- on the recruitment of participants, and also leading the evaluation. Obviously it needs a very, very rigorous evaluation if we're going to show any kind of effect.

In addition, we have a technical assistance. Right now, it's part of a contract, the technical assistance, but we're planning to award a technical assistance grant to support the six States, the six grantees, that received it.

So again, the State -- the grantees have to form partnerships across the State, so they have to partner with their VR agency and with Education, with every type of agency that would impact on these kids. They need to do what we call a coordinated set of services, carry out participant outreach and recruitment, and then we'll do the technical assistance and training. There'll be a formative evaluation and obviously a national program evaluation. They'll have performance measures like every other project out there has.

So the grantees are Arkansas; the lead agency is the Department of Ed, California Department of Rehabilitation. We have a consortia. We wanted to open it to consortia because many of the large sparsely populated States simply didn't have enough subjects. Plus we were -- and there are some politics involved in that, too, because obviously you don't want to eliminate States from a large State grant program.

So we did get a consortia, and it's led by Utah, and it's South Dakota, North Dakota, Montana, Colorado, and Arizona. Maryland, and it's the Department of Disabilities. New York, which is their mental health department lead, and Wisconsin,

and it's their Workforce Development. It's their VR agency.

The dollar amounts, I think you received -- didn't you hand out a --

Dr. Daniels: The press release?

Dr. Wexler: Yes, yes. On the press release, the differences in the dollar amounts are mainly the number of subjects they propose. So we expect California to propose. They did not have -- this does not have to be statewide, so if California, for instance -- I don't know if they did this, but if they decided we're just going to deal with Los Angeles, San Diego, San Francisco, San Jose, they could, you know.

If a State decided we're doing a particular area of the State, they could as long as they were able to recruit the number of subjects that they needed.

We have six project officers, but we're managing it in dyads, so it's two project officers share two projects. It's kind of a big deal for us because they're large grants. We have significant involvement with HHS and Labor. Also the TANAF people are really involved.

So we really tried to -- we're the lead on it,

but it goes through kind of a consortia of agencies because we all have a great deal on this. And I might add, on the actual drafting team of the priority, which had to go out to comment and then had to be redrafted, we had multiple OMB, Office of Management and Budget, examiners.

Those of you -- as a Federal department, your OMB examiner is the Office of the President, who, you know -- how can I say it? They hold a great deal of sway over what you do with your money. And so, to have them on the team was fantastic because they generally have very, very strong ideas of how those funds should be spent. And they're usually really good ideas. So that was a unique aspect of it and made the clearance go quick.

So I wanted to go quick. I wanted to leave plenty of time for Coleen, but I could take some questions if that's how you want to handle it.

Dr. Insel: Yes, questions or thoughts about this. I have one quick question. We've done something on a smaller scale, but very similar, around bundling together services and supports for people about the same age range who have had a first episode of schizophrenia.

One of the projects -- one of the things we

learned from that project was the importance of doing an economic analysis and baking that into it so that at the end we could make the business case to States. And that's worked pretty well because even before we've quite finished it, both New York and Maryland have bought it and are implementing it very broadly.

So is there a plan to do a kind of business case here?

Dr. Wexler: Well, let me say, and thank you for reminding me of that. I failed to mention a major part -- poor outcomes for kids with disabilities is certainly the major factor we're addressing. But almost as major and what really OMB's interest is, is there any way we can reduce the number of kids on SSI. I mean, so there's a huge economic piece to that.

You know, what you're dealing with, with that is asking parents to let their kids come off a lifetime benefit that supports them exceptionally well across health, finances, and a lot of other things. So we're hoping we get really good outcomes, that kids go into independent, you know, employment and are successful in it and that that in itself would motivate families to feel okay

about kids coming off.

We did an estimate, and, Tom, I don't remember the number, but it went into the computations of how much of X thousands of dollars per kid in terms of figuring cost for the treatment for them.

Dr. Insel: Okay. I mean, we really had to do those numbers and show a three- to four-fold return. And then States started to wake up and say, wow, while this cost me $8,000 per child, this is going to save me a lot of money within 2 years. So and even in my tenure as a governor, I could probably do this and show that I've saved money.

And because of the very short turnaround time for policymakers, they need to have the return on their investment within 2 years or something like that. It's really good to build that in.

Any other comments or questions for Larry? Coleen?

Dr. Boyle: So thanks for sharing this. It's a very interesting initiative, and it does track back very nicely to what Tom mentioned early in his science review where you remember that table where it actually looked at independent living for people with autism and how it was so different in terms of their ability to do independent living.

So I don't know if there's -- I didn't follow all of what you said, but are there certain risk groups? I know you don't go by specific exceptionalities, but --

Dr. Wexler: We did not define sub-populations at all. We wanted to leave it to the States, and partially because we don't know the answers to any of this. Excuse me?

Dr. Boyle: Do you know if the awardees -- the ones that were awarded, were there any of those that highlighted autism?

Dr. Wexler: I would say I don't believe any of them highlighted any particular disability. I think to tell you the truth, I think probably with the exception of California, they're very focused on can they recruit enough subjects. It's a huge, huge task. But, no, they didn't, but we hope that it -- we'll be able to mine those data as we start getting them.

Dr. Insel: Any other comments or questions? Yes, Idil?

Ms. Abdull: I just wanted to say thank you so much. I might actually like the primary education now a little bit.

[Laughter]

Dr. Wexler: We're nice guys.

Ms. Abdull: Oh, come on. And I say that I'm really pleased with it because the idea -- the fact that you are concentrating on families, or children, or people that are on SSI, which we know are obviously low-income poor families who are disproportionately minorities, who have always been underserved in every research.

And so this would be very interesting to see what the outcome is, and then how do we drive people that are poor families and not minorities, but all poor families? How do we make sure that they're becoming self-independent and are able to care for themselves, because parents are going to die, and so we want to make sure the children grow up to be independent adults.

So thank you so much.

Dr. Wexler: You're welcome. And, you know, part of what we're trying to do here is field-initiated solutions, and we don't know -- you know, there's an awful lot of smart people out in the States. And so we didn't presume to say this is what you should do. We gave examples of evidence-based practices. But they do this -- they're on the ground. They do it, and so we're hoping we see some

really great outcomes.

Dr. Insel: Scott?

Mr. Robertson: Yeah. I just wanted to add just also that I think this is an amazing, amazing project, and anything where you can be demonstrating both improvement and quality on the long term and be having cost savings at the same time, I mean, that's really an amazing goal.

And that's, I think, what we're striving for in the long term, right, that they're not -- these are not competing forces, that you can actually be, you know, improving people's lives and doing it in a manner where you can reduce costs here and then reinvest the money in other avenues to improve people's lives.

So really, really good work with this, thank you.

Dr. Insel: Terrific. It's great to hear about this. I don't think we've had it on the agenda, so this is great to know.

Dr. Insel: Coleen, do you want to take us through the Somali Project?

Dr. Boyle: Sure, happy to. And do want to say in starting out, this is a project that originated

actually out of the Committee's work and concern.

And I am representing a lot of people here. Probably I'm the one who is the least involved in it, but provide some oversight and guidance.

So I do want to recognize obviously Geri Dawson and Autism Speaks and Michael Rosenberg -- Rosenberg, is that his last name? Yes. Rosenoff, excuse me -- as well as Linda Birnbaum, NIEHS, and Cindy Lawler, who is behind me here. And on the phone, I have my colleague from CDC, Lisa Wiggins, and then obviously Idil Abdull, who brought this issue to the Committee's concern.

Dr. Insel: As a public comment.

Dr. Boyle: Yes, as a public comment before she was a Committee member, so.

Ms. Abdull: There's hope for all the public comments. There's hope.

[Laughter]

Dr. Boyle: That's right. That's right. Yes, yes, yes. So I actually need a clicker. Thank you. Thank you very much. Well, I could start talking, and we can find the slides. Does that sound good? I know I sent them to you yesterday morning.

So just as way of background, in 2008 the Somali community in Minneapolis approached the

Minnesota Department of Health with concerns about a greater number of Somali children enrolled in preschool public education programs in Minneapolis.

And the Minnesota Department of Health really shared those communities' concern and investigated and essentially reported in March of 2009, a report on the administrative prevalence of children enrolled in -- Somali children who participated in autism public preschool programs.

So they did a report that there was a higher prevalence of children of Somali descent who were enrolled in preschool public education. They did note that the racial/ethnic differences in the administrative prevalence appeared to decrease over the 3 years that were examined. So there was a 3-year period that was examined.

And then also in the report it noted that the administrative prevalence for Asians -- so other ethnic minority populations, Asian and Native American populations -- were very low in terms of their representation compared to white and Somali children.

So Idil did come to our Committee meeting, and believe it or not, it was 3 years ago October 2010.

It's hard to believe, and we did a very

masterful job of talking about her concerns and the concerns of the Somali population in Minneapolis.

And then Tom reached out to CDC, NIH, NIEHS specifically, and Autism Speaks, and jointly we were able to fund a project that was put out through a funding mechanism that we had. And it was started in July of 2010. The principal investigator for that was Dr. Amy Hewitt. She is with the University of Minnesota.

So we, in essence, used the same methodology -- we didn't, the University of Minnesota used the same methodology as the ADDM Network. And just to go through what that methodology is, so those of you who are not familiar with it can understand it, it essentially uses what we call multiple sources.

It's all record based, so it doesn't do clinical examination of the children, but it does a very in-depth look at essentially any place in the community where a child could be -- receive services -- could be evaluated. So this is both health and education records, were screened in the community to identify all children who might have an autism diagnosis.

And then those records are abstract so the detailed clinical descriptions, behaviors related

to autism, co-occurring conditions, test results, anything relative to an autism or other diagnosis would be abstracted onto standardized forms.

And then, importantly, that information is aggregated for each child, and then a clinician team -- and actually we used the experienced clinician reviewers from ADDM to actually do the reviews here. So, you know, they were well familiar with how to take that information and apply *DSM-IV* criteria to come up with an autism diagnosis.

So just a bit of information about why this methodology was used and its advantages. It's clearly a population-based approach versus an administrative approach, which was used in the initial investigation that really just looked at the reports of children in an autism special education classroom. So this was based on more of the identification of children with autism.

It allows us to capture detailed information on autism status, the clinical characteristics of the child, as well as co-occurring conditions, which is clearly quite important to understand the phenotype of children with autism. And then we were also able to capture additional information, which is helpful to thinking about how to make this

information useful to communities, and a good example of that is to understand the age identification -- initial identification as well as the age at diagnosis.

And again, to do this, we have to go to multiple sources within the community. We don't rely on previous autism diagnoses, so many of the children do have an existing diagnosis, but that's not all of the children. Importantly, it collects information the same way using the same criteria for all children. It doesn't rely on what's being done perhaps in a bit of a heterogeneous way in the community.

And I think six and seven are very important in this context because it can be implemented in diverse communities with emerging concerns. So here's a State that doesn't have an ongoing autism surveillance program, a particular community where there is a concern, and we're able to relatively rapidly address that concern.

And then I think seven is most important because it's something that we are trying to leave behind. So it requires community partnerships to make this happen. And we're growing and developing the expertise within that community, hopefully to

make them competitive both for our future FOAs, as well as perhaps State funding to continue the support here.

So this slide summarizes the project funding -- excuse me -- the project findings, not the funding. So based on children who were 7 to 9 years old and living in Minneapolis in 2010. So that was the target age and the target time period.

This color coding represents the actual prevalence rate, so you can kind of get a sense there from the colors. But the overall prevalence in -- again, this is Minneapolis, a standard metropolitan area, was 1 in 48.

We did find that Somali children and white children are about equally likely to be identified with autism, so that was 1 in 32 for Somali children, and 1 in 34 -- for -- 36, excuse me, for white children. And that translates into 3.1 percent for Somali children and 2.8 percent for white.

Both Somali and white children were more likely than the other ethnic minority groups that we have sufficient numbers to be able to report.

And those are African American or black children and Hispanic children. And those were 1 in

62 and 1 in 80, respectively, or 1.6 and 1.3 percent. So that's our first major report out or our first major finding from that.

Secondly, I think on that second bullet there, we found that Somali children with autism were much more likely to have an intellectual disability as a co-occurring condition with autism relative to children from the other racial and ethnic groups.

So, you know, that was true in terms of both black and Hispanic children relative to Somali children.

And then finally, the third major finding was that the average age at diagnosis was about 5 years old regardless of whether the children were from the Somali community, white children, black, or Hispanic children, so clearly a delay in age at diagnosis for children. So those were the key major findings from that investigation.

And then just thinking a little about – what the conclusions for the project, this was clearly the largest project to date to look at the number and characteristics of Somali children within any U.S. community. There are other communities around the United States that have substantial numbers, although Minnesota and Minneapolis is the largest.

So in some ways these findings, in terms of our understanding about autism among this ethnic minority group, is limited to Minneapolis. And, as any study, there were challenges in identifying autism in racial and ethnic diverse groups.

The estimates are high. Estimates for both Somali and for white are high, although we do say not unprecedented.

We are -- I should've mentioned initially that at the end of March hopefully, April, we'll be having our second -- our next ADDM report coming out for both eight, and this time we'll have a report on 4-year-olds. This is the first time we have the 4-year-old data.

Making direct comparisons between the Minneapolis findings and our ADDM data, I think, is a little bit challenging because temporally we're off, and hopefully we'll get a better sense of what the current snapshot looks like for the United States. However, I do want to mention two things -- oh, I'm sorry. Yes?

Dr. Insel: Just to make sure we're all on the same page is Minneapolis part of the ADDM Network?

Dr. Boyle: No.

Dr. Insel: Okay.

Dr. Boyle: No, but I do want to mention that both -- you know, ADDM represents an average across 12 sites. And some of our sites, specifically New Jersey and Utah, had prevalences that were comparable to the Minneapolis rate.

So the bottom line is children and families living in Minneapolis continue to need support, and they need to be identified as early as they can be.

I know that community -- the State, the Minnesota Department of Health, are really using these findings to try to think about ways to make improvements to early identification efforts, service planning efforts. And future research can build upon the findings to better understand how and why autism affects Somali populations differently than other children.

I think I might just say this one very quickly, but there was a lot of efforts by the University of Minnesota, Dr. Hewitt and her colleagues in terms of the data releases, in terms of both proactive data dissemination within the community, community engagement, as well as I know that Idil was very much engaged in terms of dissemination as well and follow-up with the community.

A few next steps that are already completed -- some of them that are in process. We did find support to be able to translate the CDC Learn the Signs Act Early materials into Somali, and those are available and became available at the time the project was released in December.

So, you know, these are our materials and our tools to really support communities and better understanding child development from a positive child development perspective.

The other thing is we have a small amount of funding going to the University of Minnesota to continue to engage the Somali autism community around the use of the information, so this whole idea of data to action.

So how can we help -- how can the University of Minnesota, the Minnesota Department of Health continue to help the community and the providers in terms of some of the concerns about delayed-age identification and particularly services around the profile of the -- of autism in the Somali children?

We just mentioned ASPE of Minnesota was part of the ADDM Network. It's not, but we are recompeting our ADDM Network. This spring the announcement will go out. So, you know, we're

hoping that States like Minnesota that clearly now have the experience that will apply for that funding.

And then we also have opportunities from a research perspective to try to explore different subgroups of children through our study to explore early development or SEED. We have a sizable population within SEED that have immigrated into the United States from various parts of the world trying to understand perhaps some of the risk factors associated with that.

So I just want to thank the co-funders, my colleagues, Idil, for the support. I think this is has been a real important effort. I think we all learned a lot through that process and hope that the work is helpful to the community as well as to our Committee here.

Dr. Insel: Thanks very much. That's great to hear about. It's been in discussion here for 3 years or so, so it's great to see it come to some closure. Idil, comments?

Ms. Abdull: I'm going to try not to cry, but I really just want to thank everyone starting with Dr. Insel. I think you were the first one I called or harassed, I'm not sure what the word is.

[Laughter]

And Dr. Daniels, and Dr.Insel, and Boyle, and Dr. Dawson, and Wiggins. There's so many people to thank. And I want to give hope to parents who have something they're passionate about in their children's health, that the Federal Government a lot of times gets a lot of bad flack or whatever, but that they do care, and that it may take a while.

Rome wasn't built in a day. But at the end of the day, everyone in this table is here because they care about the children with autism irrespective of their race or color, ethnicity.

So I'm very grateful to all the funders. I'm very grateful to everybody who put in the time and effort. And while the news is sad that autism is not just silencing an oral society, but it's a relief, I feel like, off my shoulders because I could see in my eyes that our kids were not talking. And I could recite preschool. But my son couldn't say one sentence, and so I wanted to know why.

And so, I'm hoping the next step is researchers -- don't worry, I won't be harassing you to fund that one. But I'm hoping the next step

would be number one, to make sure children who now have autism get the support and services they need to get early intervention rather than wait 5 years.

But also for researchers to either send proposals and ideas to fund-raise and figure out why autism hits different races and ethnicities for whatever reason, environmental, genetic, more severally or different.

I think there is a big opening of opportunity there now, and I'm hoping others can take on and carry that torch. So thank you all very, very much.

Dr. Insel: Thank you. Linda and I think Lyn had her --.

Dr. Birnbaum: I just wanted to mention, Coleen, that was very, very well done. And I think this is what -- what happened to you is an example of where something comes up at the IACC and we move on it. And 3 years seems like a long time, but for getting research done, I think it's actually a very short time.

And I want to -- Coleen, you were able to thank Tom and I, but from NIH I also want to thank Alan for NICHD's contribution and John Ruffin for the contributions from the National Institute of Minority Health Disparities because it was really a

coordinated effort.

Dr. Insel: Lyn?

Ms. Redwood: I was just going to sort of echo some of the comments that Idil made about what the next steps are. And when we see this disparity in terms of, you know, numbers in particular states from particular populations, to me that's sort of a clue. And we should really dig in to try identify what are some of the driving factors that might be influencing that.

And one of the things that I came across recently that sort of surprised me was the increased use of skin-bleaching creams in the Somali population. And I think, Idil, you were saying something that approximately 90 percent of the women are using these creams. And it came to the attention of the public health folks in Minnesota, and they actually interviewed women from Somalia.

And this is one of the reports that came out. And they identified the products that they were using, and they tested those products, and they had very high levels of mercury. The women are using these approximately three times a day, twice during the day and then in the evening. And they're also

using the products during pregnancy. They're using them to lighten the freckles and things during pregnancy. And they're also using the products while they're breast feeding. And in addition to the mercury, they also contain hydroquinone, if I'm pronouncing that correctly, which is also a neurotoxicant.

And I know the State of Minnesota has been trying to get the products off the shelves, from what I've been told. They told the store owners that they had to remove them off the shelves, so they literally took them off the shelves. And now they're just behind the counter, so the women know to come in and ask for the skin-bleaching creams.

And they're still widely available and being used. So if there could be some increased effort to try to let them know that these products could very well be toxic and could harm their unborn children, especially when they're using them during pregnancy, I think that would go a long way. And even looking at some type of investigation in terms of the use of these products in the Somali population, and how it might be related to the developmental delays and the increase in intellectual disability.

Dr. Insel: So with respect to Lyn's comment, Coleen, for this to be picked up by other scientists who want to run with it, it probably will need to be in the scientific literature. Is there a plan to publish this as a peer-reviewed paper?

Dr. Boyle: So I'm going to ask Lisa -- are you on the phone? She must not be able to be. Yes, there is --

Dr. Lisa Wiggins: Coleen, can you hear me?

Dr. Boyle: Yes. Okay, Lisa.

Dr. Wiggins: Yes, there is a plan to release a technical report. In the next few months it should be submitted.

Dr. Boyle: But what about in the peer-reviewed literature?

Dr. Wiggins: Yes, that would be in the peer-reviewed literature.

Dr. Boyle: Okay.

Dr. Insel: I think that's going to be -- I mean, Lyn brings up some interesting points about how to build on this. And without it – if it's great to have it as the report we saw -- but without it being in the literature, it's kind of hard to cite. Walter?

Dr. Koroshetz: I was just wondering -- in the Swedish study, they saw increased hyperactivity in ADHD. Did they see this in Minneapolis, too, or not?

Dr. Boyle: Lisa, did you hear that question?

Dr. Wiggins: I did.

Dr. Boyle: Okay.

Dr. Wiggins: And we certainly have the data to be able to analyze the associated features that were collected during data collection.

Unfortunately, that was not in the committee report or the initial project findings, but it will be in follow-up reports.

Dr. Insel: Jan?

Ms. Crandy: Can I make a comment about the 1 in 36? I mean, that's a big difference from 1 in 88, if that's the direction we're going in with the Korean study -- 1 in 38.

When are we going to -- so you think by March we're going to have more data to tell us if we're closer to that number statewide?

Dr. Boyle: So, yes. We have two publications that are making their way through our internal clearance, and they'll come out in the *MMWR*, we're hoping, if all things go well, for Autism Awareness

Month, which is in April.

Dr. Insel: What is the highest rate amongst the sites from the last study?

Dr. Boyle: Cathy or Lisa? So they're Utah and New Jersey.

Dr. Wiggins: Yes.

Dr. Boyle: And I want to say they're 1 in 40-something, right?

Dr. Wiggins: Well, can I make a comment on the 1 in 32 and 1 in 36?

Dr. Boyle: Sure, of course.

Dr. Wiggins: Those are actually the rates that are stratified by race and ethnicity. So the overall rate in Minneapolis was 1 in 48. And I think that Coleen made a very important point earlier about being cautious about comparing this estimate to our 2008 estimates because of the differences in time.

In 2008, we did see overall rates in Utah and New Jersey of 1 in 47 and 1 in 49. When you actually stratify by race and ethnicity, Utah found a rate of 1 in 25 in white children within their catchment area. And that's one of the reasons why we say this is high, but it's not unprecedented. We have seen similarly higher rates in our 2008

report.

But again, this is based on diverse communities. We have rates that seem very high and rates that are lower than the average estimate. And the rates for the Somali and white children in Minneapolis are certainly at the higher end of the spectrum.

Dr. Insel: Any other comments or questions about this? Great. Lyn?

Ms. Redwood: Tom, just to follow-up, are there any plans to go into these areas where the numbers are exceedingly high and do further investigations, to look for an environmental toxicant or interview the families and try to drill into what they might be being exposed or what some of the risk factors might be? And specifically in those populations that we know have higher numbers.

Dr. Boyle: And I think you have to be careful when you start to look at community size. I mean, our confidence around that estimate becomes quite unstable, and that's one of the reasons why it's very important for us to average over communities.

In Minneapolis there were 12,000 children that were involved in the 7- to 9-year age range. We generally like to look at communities of sizes

anywhere from 25,000 to 40,000. So I think we just have to be careful that we're not -- we have statistical stability. I'm not sure I'm explaining it quite right.

Dr. Insel: But we did fund Peter Bearman to chase this now 6, 7 years ago. And he went after this idea of looking for clusters in a whole range of different ways. And he found extraordinary differences in the prevalence rates, largely driven by what he called social clustering, so where there were better services and where there were opportunities to get treatments that might not be so available. They were much, much higher numbers.

And he had numbers of, like, 1 in 25 or even much higher than that, particularly in Westwood in Los Angeles and a few other places.

But it seemed they weren't related to the origin of those children; that is, the parents had moved. They were medical migrants who had moved to those areas and so gave these very, very high rates.

So it's a complicated question. I think all of us started off with the idea that if there were clusters, those clusters would be defined by the exposure to something. But it's not entirely clear

that that's the explanation, at least in the Bearman work. And that's now been published in several different places and replicated a bit.

Idil?

Ms. Abdull: I forgot to -- and I didn't mean to forget to -- also thank Dr. Linda Birnbaum. I remember I must've called, I don't know, 20 times, Senator Amy Klobuchar's policy assistant while you on the Committee saying ask her this question, ask her this question. So thank you to you, and, Dr. Ruffin, Office of Minority Health. And, of course, Alan, thank you all very much.

But I wanted to just to answer -- not answer, but maybe comment -- and Dr. Wiggins can answer.

But I did ask that question about if it's high, and, Dr. Wiggins, I think you said there is the SEED study, which is looking at about 3,000.

And they're looking at not just genetics or biology, but they're looking at environmental. Minnesota is not part of it, but I want to say that they are looking at if there are environmental causes, like you were saying, high traffic or pollution. So maybe Dr. Wiggins can elaborate a little bit more on that, that CDC is already looking into this -- at least the environmental

view.

And also in terms of the high, I think -- I don't want to concentrate so much on the numbers because 1 in 32 and 1 in 25 in Utah white case. So the numbers maybe for Somalis are not so much higher, but what's striking is that they're severe. Like 100-percent severe. There has got to be something wrong.

And so that's a future for other researchers to say what is it about this population that when they come to the Land of 10,000 Lakes that their children not only get autism, but they get it to the end -- you know, the other side of the spectrum. And so, that's a -- I think that's something that people can look at in the future.

Dr. Insel: Yes. I think this is a really critically important comment, and it sort of speaks to this issue that so many people have said, well, the increase is due to the rubber ruler, and you're calling kids who are much milder as being affected.

And yet the evidence that so many of these kids have severe intellectual deficits is really impressive. It means you've got something that's different. And so there -- that's why I was thinking to get this into the scientific community

to get people starting to probe this a little more deeply would be important. Linda?

Dr. Birnbaum: So one of the issues that we deal with when we're trying to look at the environmental stressors that might be associated is, as we start backing up the timeline for the causes of autism and get to especially the prenatal period and maybe even pre-conceptual, it's very hard to do retrospective exposure assessment. And that's something we're busy trying to work on, but it's not an easy task.

Dr. Insel: Would this be an opportunity, though, I mean, if you have a community like this, and apparently this hasn't -- is this resolved, or is this still -- I assume it's still an issue --

Ms. Abdull: Oh my God, yeah. In my building alone, there's 12 non-verbal Somalis --

Dr. Insel: -- to do a prospective --

Dr. Birnbaum: I think there might be opportunities to do a prospective study, but I think there also may be some opportunities for doing some retrospective assessments not only based on like GIS and looking at where people have lived, but also we're beginning to look at the issue of teeth, in say, bio monitor of early-life exposure

where there are rings in teeth just like rings in trees. And people are beginning to -- beginning to -- develop the technology now.

You can do it for heavy metals, for example, and you're beginning also to be able to do it for certain organics. And many parents save their children's teeth, and I think this might be a potential way to look back in time.

Ms. Redwood: Linda, to add onto that, they're also working on technology to be able to look at the pulp within the tooth, and they can do genetic studies on that to possibly identify some genetic susceptibility genes as well. I know that's preliminary, but I know that's in the works.

Dr. Birnbaum: Yes. I think the point is there are lots of tissues. Your genes don't change over time, but your exposure may. And clearly your epigenome would change, so there may be some opportunities for epigenomic --

Ms. Redwood: I was pointing out it would be one-stop shopping.

Dr. Insel: Should we be encouraging parents to save the baby teeth?

Dr. Birnbaum: It would be an easy thing for them to do. I think a lot of parents do it anyway,

and different teeth -- all teeth are starting to develop in the second -- by the second -- trimester. And actually pretty much -- the baby teeth are pretty much -- the second and third semester -- pretty much fully developed.

Dr. Insel: Okay. This has been a great discussion. I want to just open this up to hear about other new initiatives or opportunities, anything that -- Shantel?

Ms. Shantel Meek: Thank you. So I wanted to provide a brief overview and an update for some people here on the HHS/Department of Ed Developmental and Behavioral Screening Initiative.

So this has been a really huge effort over the past couple of years, spearheaded out of ACF, the Administration for Children and Families, but also in close collaboration with CDC, HRSA, the Department of Education Office of Special Ed Programs, NICHD, SAMHSA, really everybody that is involved in any way with early-childhood development.

And so, this launch, we're looking to launch in late February, and it's going to consist of three different components. The first of these is going to be a compendium of valid and reliable

screening instruments on general development.

They're not disorder specific, so it's just a broad developmental and behavioral screening instrument. And there's going to be information published in one place regarding validation, reliability, and then feasibility, cost, training requirements, languages that it's offered in, if it's validated in certain special populations, and so on and so forth.

The second piece of the launch is going to be a series of user guides, and so they're going to be tailored to a variety of different professionals that work with young children, including child care and Head Start providers, pediatricians in the medical home, home visitors, social workers, behavioral interventionists, early intervention, families, of course, social workers, policymakers, pretty much the gamut.

And they're all going to be -- have the consistent message of universal and consistent responsible developmental and behavioral screening and follow-up. And they're all going to have a slight, you know, shift depending on the audience and what is important for those audiences to know.

And then the last part of it is going to be a

resource toolkit, so it's going to be a web-site, so an electronic toolkit. And we've really compiled the whole gamut of federally-funded or federally-produced resources on child development, on where to go and what to do if you're concerned, on different tips for parents or different providers, where you can go to find local help. And we're really using the Learn the Signs. Act Early as the basis of that, but there's just really been contribution from all of the different agencies that have been involved.

And so, a few of the major messages that are going out across all of these different agencies to all of their stakeholders. Again, universal responsible developmental behavioral screening and follow-up, and really closing the loop and making this -- you know, we know that the medical home and the pediatricians can't do it alone. We know that childcare providers, for example, might see kids for 10 hours a day, whereas other professionals see them for much less time. So really making sure that we start to close the loop between early intervention and childcare providers in the medical home, and parents, and everybody is just more coordinated at a systems level.

Dr. Insel: Great. Thanks much.

Ms. Meek: Yes.

Dr. Insel: Any questions for Shantel?

[No response]

Dr. Insel: Terrific.

Ms. Abdull: I was wondering, Shantel, do you -- so for example, Head Start, and I asked you a little bit at lunch this. But Head Start and childcare providers, like the owners or the people who run this, how will they know what you're saying? I mean, it sounds all good, but if you look on the ground, there's a lot of Somali child care centers that have many children with autism. But I don't think they are aware of where to get this tool -- the resources, or any of those toolkits that you're talking about. So who makes the connection? Is it the State, or is the Federal, or --

Ms. Meek: So for Head Start and childcare, they're really different programs, so it would be a different mechanism. For Head Start, we fund it Federal to local, so we have a communication right to the grantees, right to the people on the ground. So that's a lot easier for us to share it with them.

For childcare, it's largely managed at the State level, and so every State has their own communication funnels with providers that are on the ground. We do have -- each State has a State child care administrator, and we have regular communication with them. So we send it through them, and then they disseminate to the childcare providers at the State -- across their State. For more special populations, like, for example, refugee populations, we have -- at ACF we also have the Office of Refugee Resettlement, which has more direct communication with organizations -- community-based organizations that serve refugee populations. So we could also disseminate it through that mechanism.

And then just a variety of other stakeholders we work with that aren't necessarily part of the Federal Government. So if you have any particular, you know, method of dissemination, we're also happy to extend it that way.

Ms. Abdull: I'll let you know.

Ms. Meek: Yes.

Dr. Insel: John?

Mr. Robison: I had a question for Idil. So while you were talking about the skin-lightening

cream, I Googled that and I found a World Health Organization advisory about mercury in skin creams.

And the WHO advisory particularly cited the very high rates of usage in Africa, like a 77 percent in Nigeria.

So you said it's used by most women in Minneapolis of Somali descent. Do you think that they put the cream on the children?

Ms. Abdull: No, not on the kids.

Mr. Robison: Just on themselves?

Ms. Abdull: Yes.

Mr. Robison: But through pregnancy.

Ms. Abdull: I don't think they do it or they care or they know that if you're pregnant what you put on your skin, it goes into your child. I don't think there has been enough awareness by the Minnesota Department of Health.

And I think there is so much pressure to be light, I mean, in this country. And so, a lot of Somalis unfortunately think, oh, I'm just going to do it while because I'm going to a wedding, and I'm going to get in trouble I know. But it happens, and I've seen many stores who are selling it, and I said even why are you selling this, it's been banned?

And they said because there is a need, Idil. This is America -- supply and demand.

Mr. Robison: So the thing that's shocking to me about this is that even though it's banned in the United States, the WHO report shows that you can buy this. And, in fact, any of you now can Google. You can buy it on Amazon. I had no idea you could buy heavily mercury-based face creams right now in the country with all the talk of mercury.

It's just sold with no warning.

Ms. Abdull: It's sad, and I don't have the answer, but I'm wondering -- I don't know if the environmental health department the public health arenas -- there's got to be -- there needs to be a better education in connecting the side effects for these people, that you can look light maybe for a couple of nights for a wedding, but you might end up with a child with a lifetime of disabilities and issues. And so the risk is, you know, it's not worth.

Mr. Robison: I guess it's an example of an unregulated Internet. I had no idea.

Ms. Redwood: And they actually in this report tested the products that the Somali women were using, and they did -- I forgot the number -- did,

I think, something like 42 percent contained high levels of mercury.

Dr. Insel: I want to make sure we don't leave anybody out. If there are other comments about upcoming initiatives that your colleagues should hear about. Linda?

Dr. Birnbaum: So I just wanted to mention that NIH will be hopefully soon releasing a funding announcement for soliciting applications both for R21s and R01 applications that address the contribution of the environment to autism spectrum disorders.

We know that Child Health and Mental Health will join in with us, and we're hopeful that maybe another institute or two will join us, and some of that will determine how broadly the environment is defined in the scope of this. But there are many specific areas of research interest, for example, funding -- looking at both human studies, and clinical, and population studies as well as animal studies, and cellular in vitro mechanistic studies as well.

So I think stay tuned for the release of that. I would hope -- Cindy, can you say about when? Another month or two? Yes. Yes. We hope to fund

this year. Now that we have a budget --

Dr. Insel: As of last night we have a budget.

Dr. Birnbaum: Well, right. As of Saturday it will be signed, sealed.

Dr. Insel: Thank you.

Dr. Birnbaum: Not yet delivered.

Dr. Insel: Other -- Alan?

Dr. Guttmacher: I'm going to tell you about something that may turn out to have some relevance to autism, may turn out not to. We won't know for some time I think, but potentially could be quite informative. And that is we're going to be launching an effort this year along, we hope, with a number of partners to study the least studied human organ -- that is, the human placenta.

Somebody was calling it the Human Placenta Project with an alternate goal of being able to understand and monitor placental development and function in real time, something that we're uniquely incapable of doing today, I must say.

But clearly, we know that placenta is very important for fetal development and also very important for maternal health. And more and more information that is -- an important factor in long-term health of both the woman and the child.

But for some things that we're talking about in terms of vascular flow, in terms of its unique properties in the dance of these two separate beings, particularly in terms of immune function, et cetera, there's some real potential there.

And our current ability to interrogate the placenta is quite limited, really primarily is to look at the placenta after delivery histologically, which is a pretty incomplete record of the whole life cycle of placental development and function.

So with a number of other partners, as I said, we're hoping to pull together, we're going to be able to come up with a scientific plan for this over the next few months, et cetera. And we're hoping that it'll lead -- it'll take a while, I think, to really do this -- to much better understand how the human placenta functions. And again, what its relevance will be for autism I think we'll see.

Dr. Insel: Scott?

Mr. Robertson: Can I do an update from the nonprofits here, too, or we're only doing government --

Dr. Insel: As long as you use a microphone.

Mr. Robertson: I'm sorry. It's been a long

day. I was saying can I do an update from the nonprofits here, too?

So just -- there's just a few things from ASAN and the Autism Self-Advocacy Network that I wanted to point out, one of which is there's a few new books that have come out of ASAN, one of which I think a lot of people would really maybe be excited about, is on newly diagnosed individuals who are adolescents and adults called *Welcome to the Autistic Community*.

The book welcomes people who have just learned about the diagnosis to the community, addresses common questions people may have about their diagnosis, emphasis -- emphasizes that they are not alone -- and celebrates their new identity. And it's available in two different versions, adolescent and adult.

And another really important book that came out is called *Empowering Leadership: A Systems Change Guide for Autistic College Students and Those with Other Disabilities*. And this is for college students, teaching leadership skills, autistic college students to make their campuses more inclusive, supportive, accepting to just bolster the leadership skills for later on for

employment and community living.

And so, the book talks about campus advocacy, and navigating service provisions, and the combinations, and engaging in active conversations with administrations at schools, and running advocacy campaigns, and exploring different aspect of disability studies.

The second thing that I want to mention really briefly is that the third iteration -- so the third iteration -- so the third year already of the Leadership Academy that ASAN runs, the Autism Campus Inclusion Leadership Training Academy, which annually trains about 15 or 20 autistic college students from schools nationwide, just had a call for applications go out. And I believe that's going to be held, I think, maybe in June. It's always held in the summer in the Baltimore-Washington area. Last year, and if the location stays the same, it was held at George Washington University's campus.

And the third little brief item that we were really excited about is that we have a new Federal grant to operate. One of the disability self-advocacy leadership initiatives funded through the Administration on intellectual developmental

disabilities. In this case it's called the Pacific Alliance on Disability Self-Advocacy for Leadership Development and self-advocacy training in the four-State region of California, Oregon, Washington, and Montana.

And in that case it's not autism specific. It's broad IDD/DD, but it's sort of intellectual developmental disabilities broadly. But it is definitely inclusive of autism in that group, and we do have people with developmental disabilities, broadly including autistic people, as part of that leadership of that initiative.

And I just also wanted to just mention in passing that we're also really excited that we were ranked sixth by Philanthropedia, a division of GuideStar, for national disability nonprofits. And ASAN was particularly excited about that because we're one of the young groups that is actually ranked in the top -- I think we're the youngest certainly in the top 10. So I think it speaks to a lot of these different initiatives we have that are helping to improve folks' lives, particularly for adolescents and adult who have not, you know, historically had good supports and services for empowerment and leadership development.

Dr. Insel: Terrific. Jan?

Ms. Crandy: I have one quick question. Is it possible to add onto the agenda for in April a review of the regs for the CMS? I think it's on home- and community-based waivers that just came out last -- I think it came out on Friday or something, the implications.

Dr. Insel: I think it just got added. Thank you. Susan will --

Dr. Daniels: Well, we'll talk to John O'Brien about that.

Dr. Insel: Yes, we'll make sure John is around.

Dr. Daniels: Can you send me an e-mail about that so I just have a record of that? Thanks.

Dr. Insel: That's a great idea. Alison?

Ms. Singer: So I wanted to remind everyone that the International Meeting for Autism Research is going to take place this year on May 15th to 17th in Atlanta. INSAR has travel awards available to support graduate students and postdocs, and the Autism Science Foundation has travel awards available for stakeholders -- parents, individuals with autism, teachers, therapists, and others -- to encourage participation of stakeholders at the

meeting. So there's more information about that on our web-site.

Dr. Insel: John?

Mr. Robison: I would just follow up on that by saying as a Co-Chair of the Community Committee, I would encourage any stakeholders who can join us in Atlanta, we're going to have a stakeholder luncheon and we're going to have other stakeholder events there, you know, to try and connect the community and the researchers better.

I have another tidbit of news for our school, if I can -- we have the one there. Some of you know that, you know, I've taken -- I've joined up with the folks at William and Mary to create a neurodiversity initiative. And I think it's worth mentioning here because to the best of my knowledge, it is the first multi-department neurodiversity initiative in a major American university.

So what we are doing is we're creating regular neurodiversity courses, which are starting actually with the opening of courses next week, so that we can teach neurodiverse people how to be more comfortable being part of the college community and at William and Mary in particular.

But also how to teach William and Mary students who want go on to work with neurodiverse people about the ideas of neurodiversity and the community. And, of course, it's centered on autism, but also other neurodiverse differences.

And what we hope to see ultimately is that our neurodiverse students, plus students involved in psychology, government, and education -- those are all departments where William and Mary is pretty solid in leadership. I'd hope to see people from many departments join the initiative, and I hope to see other colleges around the county follow suit.

And I'm particularly proud to be the scholar-in-residence on neurodiversity because my eighth grandfather was the first scholar-in-residence at the College of William and Mary's founding in 1699.

And so, anyway, we have that on the website. Yes, the provost really liked that.

Dr. Insel: How did you know that? That's amazing. Okay, John.

[Laughter]

Mr. Robison: That's right.

Dr. Daniels: That's right.

Dr. Koroshetz: Yes. I just wanted to throw out one thing with regard to a lot that's been

discussed. We've had a lot of issues, but we think we've finally gotten all the samples from the Norway birth cohort to Columbia. And that's a study where they followed mothers collected cord blood and maternal blood and assessed exposures to a whole bunch of things, including infections and immunization.

And so, we're hoping that -- I mean it's a really amazing project to get done. And so we're hoping it leads to something, but it looks like it was at least successful identifying probably most of the autism cases in Norway during that period of time.

Dr. Insel: So, Walter that might be another one that we put on -- maybe we'll make it for April, but maybe July. I think, you know, many of us have watched that project thinking that is so critical for so many of the questions that have been on the table here for a decade. And it would be great to see that finally deliver. They've got a big cohort now, and they've got all these samples, so I'm really eager to see the results.

Let me -- I'll finish with just a couple of things from NIMH. Actually this is a -- NIMH and NINDS together have been leading the President's

BRAIN Initiative at the NIH BRAIN Initiative, and we now have six RFAs out. This is a really high-profile effort.

As I think some of you know, the President decided in his second term that he would do one major grant challenge in science, thought about a lot of different areas whether it could be climate change, environment, energy. Ended up doing this on the brain, and we're really excited at NIH to lead a big effort around creating new tools for studying brain disorders. And some of this will ultimately be enormously helpful for understanding brain development in normal and kids who are at risk.

NIMH did put out an RFA that closed in November, so the grants are in. They will soon be -- I think they haven't gone to review yet. They soon will. It's around actually three RFAs all around services, early identification and linkage to services, transition, age, youth, and the challenges they face, and pilot studies of service strategies for adults on the spectrum. So these were three areas identified in the plan.

This is literally a case where the plan was just taken, and the program officers, just in the way we talked about early this morning, decided

that they found the gaps and they would try to close those gaps with some investments.

So hopefully by the time we meet -- certainly by the summer, we'll have the review done, and we'll know what that investment will look like. But we're pretty excited about that as a new large initiative for us. So in addition to the environment, that's coming up and a few other things. I think there's -- in spite of being a very tight budget time where we took a 5 percent cut last year, --

Dr. Birnbaum: Seven.

Dr. Insel: -- we are still trying to make this a priority.

Any last comments before we adjourn? It's been a long day, lots of conversation about many different topics. But I appreciate everybody being so engaged, and I'm going to leave the last word to Susan then.

Dr. Daniels: I just have a last couple of items to mention. I just wanted to mention that Denise Dougherty from AHRQ has stepped off the Committee. AHRQ has new leadership, and they are in the process of doing some new planning. And so, they are not going to be on the Committee for now.

And I also wanted to mention the date of our next meeting is April 8, 2014. And so we look forward to seeing you all here. We'll be safely past blizzard seasons, so hopefully we won't --

Dr. Insel: Cherry blossoms.

Dr. Daniels: We'll have cherry blossoms, and we'll look forward to seeing you in Autism Awareness Month.

Dr. Insel: Thanks, everybody. We're adjourned.

(Whereupon, the IACC Committee meeting was adjourned at 5:04 p.m.)