Lillian Sugarman: Wow. So many, so quiet, so fast. That's amazing. Well, welcome. Welcome, welcome. My name is Lillian Sugarman, and I have the distinct pleasure of being the Director of the Early Head Start National Resource Center who in turn has the distinct pleasure of providing the birth to three institute for you as directed by the Federal Government, the Office of Head Start. And I welcome you all. There are so many of you that I don't really think I can see you all. And you know what, I don't want to say anything to make you know that I'm really a scaredy cat, but I'm happy that I don't see all of you, not all of you here because you'd spread way, way down in the back and on the sides and you know, it really, really warms my heart that so many of you are here. Because what I really know is that you and all of us are here together for one thing, and that's for the babies. For the babies, their families and the services that you all provide. So I'm thrilled to be standing here in front of you, but with you and respect you so much for all the wonderful work that you all do. I want to let you all know that if I had my way, we'd go around row after row and everybody would stand up and say, high, my name is, you know, Sandy Smith and I work in the such and such program. But I'm told that other more important people are here to give you messages and so I won't do that. But I do need to let the folks up here know, and I want you all to know who is here. And first we'll start with the people who have really made this possible, and that's the Federal Government. And so I'm going to ask wherever you are, please if you're a part of the Federal Government, please stand up so we can give you a real round of applause. Come on. Up on your feet. [APPLAUSE]. All right. This is a big thank you, a big thank you, a big thank you, for sure to make this possible for us. And then there are lots, lots of folks here who I want to applaud as well. And I'll first ask the folks who are here to provide technical assistance, those folks who are our child care and our Head Start infant and toddler specialists and all the other technical assistance folks please stand up because we want everybody to see who is going to make our program successful. Please stand up. [APPLAUSE]. Very good. And I wonder if anybody from the Early Head Start National Resource Center stood up. But I don't where they are. They're all so busy running around, loading these flashlights getting everybody to come and sit down. But I'm going to do a little shout out for Victoria Prieto, [inaudible] Summer Harrington, I should never started this.Holly and Yvette and all the staff in the EHSNRC, please stand up because you really help to make this happen this morning, too. [APPLAUSE]. So okay. But who are the important people? The people that really work with the babies in their programs. Who are they? Let me ask everybody whether you're in child care, whether you're in Early Head Start, whether you're in Head Start, all of you who are touching the lives of babies every day, please stand up because you need a special salute. Come on. [APPLAUSE]. All righty. Look. Well, just saying thank you for the wonderful work that you do is not enough. But please know that it's heart felt. Really. You do God's work, you really do. And it's anenormous responsibility. And I want you to know what an enormous responsibility it is and I want you to know all the people who have stood up before you are here to support you. And if there's anything who I didn't ask to stand up, I want to you do that. Let me see if we have some parents in the room because parents trust us with their babies, don't they? So are there some parents in the room? Come on. [APPLAUSE]. Thank you for letting us help you support your babies. Thank you so much. Okay. It's really my pleasure to be the person who brings more special people to you. And so at this point in time, I want to introduce to you two incredible women,Yvette Sanchez-Fuentes and Sannon Rudisill. Yvette is the Director of the Office of Head Start and Sannon the Director of the Office of Childcare. And for those of you who don't know that, child care is now an office of Childcare, which means a very important thing which means really the government is now recognizing that child care is important enough to have its own office. [APPLAUSE]. Right. Let's applaud that for sure. And I'm just kind of funny because I really think that all of us who care for children are doing child care, but you know, that's just me. Some people don't see it that way. But it's okay. But it's my pleasure now to introduce to you a wonderful friend, wonderful colleague, and incredible leader, an inspiration to all of us, a very young person who is now the director of the office of Head Start. I'm sorry there's a point in time when you reach a certain time that everybody is young. But Yvette and Sannon are really young people, they really are. And they're wonderful leaders. But I'll tell you just a quick statement or two about Yvette, who comes to us -- this is going into your second year of leadership, isn't it? Yeah. Yeah. So she's like an old timer now. And probably many of you have even had an opportunity to hear her or lead her. But she's still a bright young shining face. And the two of them together are the leaders of our future. Don't mistake anybody, you know, if they say otherwise. Really. Because -- or don't believe them because these are the leaders of the future. But Yvette comes to us from the directing the migrant and seasonal Head Start association. And prior to us she was a Head Start fellow, prior to that she worked in a Head Start program in California, and well, I don't know what she did before that. She was just doing what the rest of us do, try to get to the next step of life. But at any rate, she has brought wonderful, wonderful opportunities for all of us and for all of you in her leadership during this most amazing time for all of us when the funds have allowed us to almost double our Early Head Start programs. So please join me in welcoming Yvette Sanchez-Fuentes. Yvette Sanchez-Fuentes: Good

morning, everyone. Okay. I know that there are more people in this room than that. So good morning, everyone. Thank you. I want to welcome you all this morning. It really is a pleasure for the office of Head Start to see so many people in this room. I think that this is one of the biggest conferences that the office of Head Start, along with our partners have ever hosted so it is truly a pleasure and honor to have you all here and to be here with you. I first off want to thank all of our staff at the office of Head Start and throughout all the regions for all the work they have done to make Early Head Start and serving babies and toddlers across this country a real success. I also want to thank Lillian and her crew over at the Early Head Start National Resource Center for all the work they put into putting together this conference and making sure that the sessions that are available to you are really hands on sessions, materials, information that you can take back and use on Monday morning. And we know that that's one of the reasons why folks really enjoy come to go this conference. So it really is a pleasure to have you all here. I just want to share a couple of things with you today about what's happening at the office of Head Start. But also in general what's happening with early childhood at ACF. Sannon and I, the Office of Head Start and the Office of Childcare both are part of a larger vision, and early childhood vision that really speaks to the continuity of care for vulnerable children and families and really for all children and families. It is really our vision to make surely that what we know our best practice is, what we know our information and resources are, that all of that information is made available to everyone out there who's impacting the life of a child and a family. We have really strived over the last year to try to bring our two constituencies together in a more proactive way. We want to make sure that anything that's available through Early Head Start and Head Start and anything that's available through child care is available to everyone. Sometimes, you know, we have some barriers that we have to get through, but we are definitely willing to fight those battles to make sure that we are indeed raising the standards that we're at the same time supporting quality and that most of all that we're holding programs and providers across the country accountable for providing quality services to all kids and all families, especially our babies and our toddlers and their families that we know they're going through so much change. So that's sort of our first message. The other piece I want to say to you is that this was actually the first venue I spoke at when I came on a year ago. So it really is a thrill to be back here. And at that time, we started to talk about the roadmap, the roadmap to excellence. There were four major priorities in that roadmap. A year later we're finally seeing that roadmap come to life and I just want to remind you all of a couple of things, because I want to make sure that you all are part of that process and that you impact what we do every day. So, first of all, is that two weeks ago most of you probably noticed that the office of Head Start published a notice of proposed rule making for designation renewal, the recompetition. I really want to encourage all of you to look at that proposed rule because it's going to impact the way that our programs do business every day. And that proposed rule I just want to make clear is not just Head Start, it includes Early Head Start, its Early Head Start, Head Start, Migrant and Seasonal Head Start, American Indian, Alaskan Native programs. All Head Start programs will be impacted by this rule. So please, I know that you are all very busy in what you do every day, but take some time to read it, to analyze it and send us your comments, the public comment period closes on December 21st we are federally required to respond to all your comments. But this is the public and the Head Start communities' opportunity to give us your best recommendations on how we should move forward with recompetition. So please, take a look at that. The other piece that is very exciting for us is that we had introduced a whole new redesign of the national training and technical assistance system. And two weeks ago we were very excited to announce four new natural centers that will join our existing Early Head Start national resource center. Those four centers include the Center on Quality Teaching and Learning which was awarded to the University of Washington and their partners, the National Center on Cultural and Linguistic Responsiveness which was awarded to Bank Street College, the National Center Program Management and Fiscal, which went to the academy for educational development, and the fourth national center, the National Center on Parent, Family and Community Engagement, which went to Braselton touch points at Children's Hospital. So we are very excited about the road that this -- these four national centers are going to take us down. We really believe that they're going to raise the quality, put out what we know are best practices around serving kids and families.I mentioned the last center, the center on national -- the National Center on Parent, Family and Community Engagement because that was one of our other pillars. We really want to make sure that we know what we're doing every day is best for families, and that we are supporting families in the best way for them. We know that families come in all different shapes and sizes and it's time for us to take that into account as we think about what we want to do every day for those babies and toddlers that come through our doors. We need to be able to provide families with the information, the resources and the support that they need to really be their child's first teacher. We want to make sure that we're meeting families where they're at. And at the same time, we want to make sure that we're supporting our staff at the local level. We talk a lot about professional development. This is one area where we have lagged over the last couple of years and it is really our intent to focus on this area, to make sure that those folks who are having to work with families every day are also feeling supported. So those are just a few

points that I want to raise. The last piece I just want to say is that there are so many of you here, but we also know that there are so many that we couldn't have today. And I know when I was talking with Lillian and other staff this is a piece that was really difficult. So I really want to encourage you to be a part of everything that is happening every day, be really purposeful about going to the sessions that are pleading planned, make sure that whatever you get you take back to your programs, you take back to your other local programs, folks that you probably work with on a regular basis. So please take advantage of everything that this conference has to offer to all of you. And before I introduce my colleague, Sannon, I also just want to thank all of you for being here, for taking the time to grow in your own professional development, take the time to learn something new here, to meet some new people. There's so many people here today. So thank you all for what you do every day. It really is hard work. And it's at the heart of changing, of really changing the lives of children and families. So thank you very much for being here today. [APPLAUSE]. So with that, you know, as I mentioned, Sannon and I are really sort of boosting our efforts to make sure that we come together in a very proactive way. And so I want to welcome and thank my colleague Sannon for coming today. We have a lot of child care people here, which is really exciting. Again, we want to make sure that everything that is available is available to everyone. The one thing I want to say about Sannon is that she has a real passion for child care. I think that our passions are equally matched with Head Start and Childcare, but ultimately what we really share in common is that we both came here with the intent of producing real reform for early childhood education, not just Head Start and just Childcare, but early childhood education. And the other thing we share in common is we are both mothers of young children. So you'll often hear us telling personal stories, but we're not going to do that today because Lillian told us -- oh, you are, okay, good. She's going to do one. So you'll often hear us tell our stories. But I think what's important, also, is that we also understand where many of you are coming from and we understand where many families are coming from and the challenges that families face on a day-to-day basis. So with that, I'm going to turn it over to my colleague, Sannon Rudisill, the Director of the Office of Childcare. Sannon Rudisill: I just want to thank Yvette for having me. Ways so happy when she asked me if I could join you all this morning. She is such and amazing partner, she's so open minded and fun and just we have a great time when we're together. You know, trying to come up with creative ideas to support from you the federal level to do the points that you're trying to put together at the local level. And the other reason I was so excited because I was so excited to be in a room full of infant, toddler, baby people. I am a baby person myself, and so it's always good for me to come and be in a room full of baby people. And actually one problem that I'm struggling with right now is that I don't have an infant or toddler anymore, I have a four-year-old and seven-year-old, and Yvette just has a seven-year-old, too. So we're talking about that sometimes, comparing Halloween costumes, choices and stuff. But with my four-year-old I was telling Matthew Melva, the executive director of Zero to Three just yesterday, I could see how my desire for infant to toddler is affecting the way that I interact with him. Because he's four, he's huge, he's 45 pounds, I think, and I'm so willing to carry him. And I would not carry his brother. I mean if his brother had come up to me when he was four, will you carry me, no, I will not. But Wesley, the four-year-old, I will carry him, I will baby him, you know. He comes to the morning breakfast table with his blanket and instead of trying to wean him I'm like he still has the blanket, we're okay, he's still a baby. Lillian is pointing out this is why people have more than two kids, and believe me I am painfully aware that this is another way we could solve this problem, and I discuss it with my husband on a regular basis. But unless Lillian wants to call him up, I think -- [Laugher]. All right. So moving on. So you know, one of the things Yvette and I find a great point of intersection is what -- she already said it. What our vision for not just Childcare, not just Head Start but for the children and families that we serve is really the same. And I was noticing as I wrote down a few words about what I wanted to say, but what I want for babies it was the same thing that Yvette was writing down about what she wants for babies, right? We want our babies, our toddlers, and in our program all the way straight up through school age kids, but we'll talk about infants and toddlers today. You know, we want quality, and we understand that quality is based in a warm and nurturing relationship. So we want to be able to help our families access high quality with warm nurturing caregivers that understand infant-toddler development and, this is important, once we manage to achieve that, which as you all probably know, we have a variety of challenges in achieving that, we want to keep them in those arrangements longer. We want them to have continuity of their relationships which for us in Childcare means about a thousand things, because it means we're trying to stabilize their subsidy receipt and we're trying to stabilize their lives enough that they're not having to move all the time and their work is not constantly influx and then we need to stabilize teacher turnover. I mean, it's a very complicated set of challenges, but we know it's important. And I think we're just at the tip of the iceberg of the things that we can do to try to improve continuity. And of course the other thing is that we want comprehensiveness, which is something that we feel like we could achieve better through partnerships with Early Head Start where that's a core part of the vision. And in Childcare it's a core part of what we want for families, but for a variety of reasons having to do with funding and other things, you know, it's more of a

challenge. So I would charge you all that that's one of the main reasons why I'm excited about the possibility for partnerships is because of the possibility for comprehensiveness and two generation interventions that support our moms and dads as well as their babies. I just thought I would say a few words because I think it's important, and I'll apologize for those of you who have heard me before, because I talk about this a lot. I want to talk a little bit about the statistics of who is participating in the Childcare subsidy system right now. I mean, first here's the good news. We're subsiding in the Childcare subsidy system 1.6 million kids every month, which is a lot of kids. And it leverages some tan fan, social service, block grant and other money, so in total there's almost two and a half million children who are able to receive Childcare subsidies each month. Just as important and often time not realized, out of the Childcare and Development fund, we are currently investing one billion dollars in quality every year. And here -- yes, I agree, it's huge investment. And I know that when you're talking to folks in your states because the number of kids that we're talking about is so vast, it seems like there's not enough quality to go around. And we acutely feel that. But the think I'd like you to know and to give some credit to your state administrators for is by law, and I mean both our regular Childcare and Development Block Grant Act as well as the annual appropriations from congress, states have to invest about 7 percent of their money in quality. In fact, they invest much more. They invest 11 percent. And in some states that's going up as high as 25 or 30 percent. So I think that's a huge sign of commitment that, you know, our child care systems in this state share your goals around quality and comprehensiveness, it's just the world is so vast that it still feels and is scarce. We have 500,000 low income infants and toddlers being subsidized out of the Childcare and Development fund. That's huge, right? Yet, we're only serving one in six eligible kids. I want to be sure that you all know that the kids who receive Child care subsidies don't differ on some key demographic factors from the babies in Early Head Start. Half of them are under poverty, even though their parents are working. Okay. So these are very poor working folks. 80 percent of them are under 150 percent poverty. Over 85 percent of them are living with a single parent, and they're in care a lot of hours. Now, I didn't actually -- because our statistician was very buys yesterday on a different projects, I didn't have them cut by infants and toddlers, but the average amount of care given to a kid with CCDF is 136 hours a month. That's a lot of care. Which means it's more important than ever that that care be high quality. And, as I'm sure some of you are all too painfully aware, our reimbursement is about $4500 on average. Now, that's for the total population up to 13. So the baby reimbursement is probably a couple thousand dollars higher. But you all see the challenge there, the number of hours of care we're providing and the amount of reimbursement that is there. So all of these, I wanted to point out some of these statistics but first I want you to join me in being worried about what we're able to offer to our babies in Childcare and really help describe why we're so excited about partnerships because as Yvette so eloquently described, we want to reach all those children and families. And we really think the partnerships offer a tremendous opportunity to do so. And, in fact, in Childcare you all have the roadmap, we named our work plan Pathways and Partnerships to Childcare Excellence, and that's partially because we see that, you know, we can't do it alone in Childcare, we're working with the Maternal and Child Health Care, we're working with the Office of Head Start, we're working with numerous offices to really try to improve the quality and comprehensiveness through working together. And in terms of Pathways, I just want to talk a bit about the fact that in Childcare, at least at the federal level, we work at the policy level. We work with our state and territory and tribal governments because that's who receives CCDS, and they quite frankly have tons of flexibility around the policy choices that they make. The reason we went with Pathways is because we recognize in Childcare we have such a diversity of programs in terms have auspice, in terms of home or center, in terms of teacher qualifications, that we think the most promising interventions for helping move the whole field together in Childcare is to meet folks where there are. So the half-ways we're talking about are quality rating and improvement systems which some of you may be aware of from your states. The things we love about this is it gives an opportunity to meet people where they are and then provide some financial incentives and technical assistant to help them move up to ever increasing levels of quality. And I really hope you're getting involved in your states in the quality rating improvement systems. And for our teachers and infant and toddler caregivers really it's about professional development systems because in a lot of states you all know you can start working in Childcare with a high school diploma and maybe a few hours of training. So we want to meet folks where they are there and build professional development systems and career ladders that help them choose this profession intentionally, continually develop their skills, we want all those clock hour workshops to add up to something meaningful and be organized around a curriculum and we want to build up infant and childbirth credentials so we have more specialization for folks who are caring for infants and toddlers. The reason why I wanted to bring these up is because as we're working at the systems level in state and we work with our states to do that, it's critically important that we take into account the unique needs of infants and toddlers in these systems because we all know that they're not just like little four-year-olds and we don't want their needs to be lost. So that brings me to what I'd like to you do. I'd like to you really get involved in the state level in your communities and in your states. And

I don't know who I this from but I always use it. You know, I'd like you to be the voice of babies, right. Go to those meetings, read your state CCDS plan, get involved with your state advisory council. And I hope you'll join us in thinking that we really want to reach outside of the bounds of any one program to reach all the infants and toddlers and one way to do that is through policy. And you're the folks who can really come to the policymakers and help them understand challenges your families are facing and what your infants and toddlers need. So I hope you'll take us up with that and work with your states around there. And I would just finally say I will mention some of the things we're doing together. So just a few things, for example, for you to know is just yesterday we had our infant toddler specialist across Early Head Start and Childcare together here for a pre-day. Both Early Head Start National Resource Center and our National Infant Toddler Childcare Initiative are housed at Zero to Three. They are working together very intentionally around technical assistance, including joint webinars and finding great models of partnerships. We have joint policy meetings going on between the Office of Head Start and Childcare, so we can think about ways that Childcare subsidy policy and Head Start performance standards, and cure rice systems all fit together. And we're working on a demo funded by Early Head Start recovery act dollars, Early Head Start for Family Childcare which will be an opportunity to put consultants in a select number of Early Head Start programs and see if consultants based out of Early Head Start can work with community family childcare providers to raise the quality of those family childcare settings, not just for the Early Head Start enrolled kids in those family childcare settings, but for all the infants and toddlers in those. And we're hopeful that if we get good results for that that would be a model that we would embrace and really scale up in the future. So we're excited about this very large amount of work we're doing together, and I really appreciate you all inviting me to joining you this morning. [APPLAUSE]. Lillian Sugarman: Thank you both Yvette and Sannon. And at this points I'm going to ask you folks to leave as we give them another real warm round of applause. APPLAUSE]. And at this moment we're coming and going. But it is my pleasure to invite Alison Gopnik, our keynote speaker to the podium. And I want to just tell you a quick fact or two, because what I tell you about her is certainly going to pale into comparison that what it is you're going to learn from her as we are all gifted to have her come and share with us. Alison Gopnik is a professor of psychology and an affiliate professor of philosophy at the University of California at Berkeley. And she received her degrees from both Magill University and her doctorate from Oxford University. She has many, many honors and if you don't mind, Alison, I'm not going to read them all. She was one of the founders have the theory of mind, illuminating how children come to understand the minds of others. And she formulated the theory theory, the idea that children learn in the same way that scientists do. I think probably some of you know that she is an author of a hundred or more articles and several books, including words, thoughts, and theories, coauthored with Andrew Meltzoff and the Scientist in the Crib, which I imagine many of you are more familiar with, and she co-authored that with Andrew Meltzoff and Patricia Kuhl. Some of you may remember, we had Patricia Kuhl be a keynote about five years ago or so. And the Philosophical Baby, what Children's Mind Tell us About Love, Truth, and the Meaning of Life. The Scientist in the Crib was a San Francisco Chronicle bestseller and was translated into 20 languages and was enthusiastically reviewed in Science, the New Yorker, the Washington Post and the New York Review of Books and others. She has spoken extensively on children's minds, including speeches to many different audiences. But I think this is going to be your best audience. And most importantly, of course, along with many appearances on TV and radio programs, she has three sons, and that's the most important. She lives in Berkeley, California. Please join me in welcoming Alison Gopnik. And Alison, I'm going to go down so I can hear you. I'll come back at the end. [APPLAUSE]. Alison Gopnik: Oh, great you can all hear me? Wonderful. Well, first of all, I want to thank you all so much for inviting me and for all the amazing and wonderful work that you do, which I greatly appreciate. I want to remind Sannon who I guess is here somewhere, just tell her I have actually three babies, three sons. And people ask me sometimes when I have the book, The Philosophical Baby, what's my definition of a baby? And I say a baby is anybody who has chubby cheeks and sort of funny pronunciation and as soon as you see them, your heart just melts the glove. Unfortunately on that basis my baby, my youngest son, who I still sort of basically think of as being a baby, certainly in terms of how I feel about him, so I can completely relate to Sannon. But I don't really try and pick him up because he's now 6 foot 3 and 230 pounds and tattooed and pierced and about to become a clinical psychologist himself. But all of his very many girl friends assure me that the basic definition totally adorable, and your heart melts when you see him, he still counts as a baby for them. So you don't entirely lose your babies even when they're 23 years old. So let me start out by -- let me start out by saying something in general about why you would think about babies in the context of philosophy or science. So for most of the history of science and philosophy people thought that babies were basically sort of defective grownups. So people would even great developmental psychologists like Jean Piaget said that babies were egocentric, they were irrational, they were amoral, they were restricted to their immediate sensory experience, they couldn't think much. Et cetera, et cetera. People said that babies were blank slates or babies lived in a blooming, buzzing confusion. And over the last 30 years we've

discovered that all of that was wrong, that even the very youngest babies already know more and learn more than we ever would have thought before and I think also experience more and care more than we ever would have thought before. So let me say just a few words about how that enormous change happened. I think that for all of that time, the people who knew babies the best were sort of saying, you know, this doesn't quite compute. I'm looking at these babies, I think she recognizes me, I think he wants this, I think she cares about me. The philosophers and psychologists and psychiatrists were saying there, there, right, oh, you sweet moms of course you're going to think that. I think part of that was because the people who are writing the psychology and psychiatry and philosophy books were not the people who were taking care of children. The philosophers and psychologists were for one thing mostly men and the people that were taking care of children were moms. And other caregivers. And it's really only in the last 30 years or so that us moms have started doing the philosophy and psychology and psychiatry and realizing how much it's actually there. But there's another reason. And the other reason is from a scientific perspective isn't enough just to look at the baby and say oh, I'm sure she recognizes me, you need to prove scientifically what it is that babies and young children are thinking. And until recently that was a very difficult thing to do. The writer P.G. Wodehouse once said that babies look like badly poached eggs, which is sort of cruel but it gets the fact that babies have these little squeegy faces that are always moving around and you think you see something and then it disappears. So how could we actually prove scientifically that babies and young children know so much? And really what's happened over the last 30 years is we've used things like videotaped to actually be able to look for instance at what babies feel like, what their faces are like, what they are looking at, what they are reaching for. And we've learned how to ask babies questions and have them tell us what they think in their language instead of our language. So instead of getting them to fill out five part questionnaires, which babies look really dumb when you ask them to do that, what we've started to do is look at what do babies look like, what do they reach for, what do they look at. And even with three-year-olds, for example, if you just ask a three-year-old what they're thinking, you're likely to get a beautiful monologue about ponies and birthdays but you're not likely to get anything that looks very logical or coherent. So even with two and three-year-olds we've had to learn ways to ask very focused questions in ways that they can understand. And I'll talk a little more about how we do that a little later on. And by doing that, what we've discovered is that even the very youngest babies far from being egocentric and irrational are really the greatest scientists on earth. And as Lillian mentioned my previous book was called the Scientist in the Crib, and very, very literally, what we've covered is that even these very, very tiny babies are learning about the world in the same way that the very greatest scientist. So you might ask, again, as a scientist one of the ways that we try to understand something like young babies is by trying to think about them the way a scientist would. And from a scientific perspective, some of the kind of scientific ways we can think about babies involve things like thinking about them from the perspective of evolution. Now, if you think about babies from the perspective of evolution and with apologies to the babies here in the audience it at least looks at first as if babies are completely useless, right in babies don't bring any money, they don't help clean up the house, I mean especially the little babies. And, in fact, you could argue that babies are actually worse than useless because we have to put so much time and energy into just keeping them alive. Now, if you think about it for a minute from an evolutionary perspective, that's really strange. Why would we be designed so that we have this long period when we can't do anything for ourselves and we have to have so much energy going into just taking care of us from the people around us. That seems like a really weird scheme for an animal. It turns out that if you look across lots and lots of different species of animals, you see an interesting correlation. And, in fact, the first work about this wasn't done with people at all, it was done with birds. You may be wondering what this slide has to do with babies. So the poster children for this argument essentially what happened was people discovered that the longer the period of immaturity for an animal was, the smarter the adult animals were. So the more smart and flexible the adult animals, the longer the baby animals depend on moms and caregivers. And the poster children for this are the animals that are in this slide. On one side what you see there is a New Caledonian crow. And crows and rooks and other issues are as smart as chimpanzees. They're incredibly smart birds. And this is actually a picture of this crow who has learned how to -- this is from the cover of Science Magazine, who has learned how to actually make hooks out of pieces of wire to get food. Incredibly smart, flexible animal. On the other side, again with apologies to chicken lovers in the audience, this is our friend the domestic chicken. And chickens are basically as dumb as skunks. So chickens are really, really good at pecking for grain and they're not much good at doing anything else. And baby crows are fledglings for a year and a half, which is really long in the life of a bird. So baby crows are dependent upon the adults. Baby chickens, you can basically get a nice roaster by the time they are eight or ten weeks old. And you see this not just for chickens but for lots and lots of different animals. So why would this be? Why would it be the smarter and more flexible the adult is the longer the babies are immature, the longer they're babies? And the answer seems to be that some animals like crows and like us really depend on learning about our environment. The chickens are really good at doing just one thing in one place at

one time. What the crows are good at doing is taking a piece of wire and figuring out something brand new to do about it. So they're good at learning about lots and lots of different things. And what -- now, that's a great strategy. That means that you can go into a brand new place and figure out what to do. But it has one drawback and that drawback is that until you do all that learning, you're going to be helpless. So you don't want to have the mastodon charging at you and be saying I don't know, how should I deal with this mastodon, I could use a stone, I could use a spear. You want to know about what to do before you get there. And nature's solution to that problem is babies. So the way that nature seems to have solved that problem is by having a kind of division of labor between babies who don't actually have to do anything except learn. Their job, literally, babies are designed to learn. That's what babies are for. And then grownups who can take all the things that we learned when we were babies and actually put them to use to do all the things that we want to do. So my slogan is that babies are the research and development division of the human species. So they're actually the blue sky, brainstormers, off in their own world and we're production and marketing. So we're the ones who are actually taking these great ideas that the babies learn about and think about and actually putting them to use to go out and do things. And as often as the case with production and marketing people, we start to think oh, boy, those people have all the luck. How come we're having to put in all the hard work? But they're the key to our actually being successful. And of course if you think about human beings, it turns out we're the most flexible, the animals, the ones who live in the most different environments, the ones who rely the most on learning and knowledge and our babies are immature for much longer than the babies of any other species. My oldest son is 32, and at least until they're 32 we're paying the mortgage and we're taking care of them. But even, you know, leaving aside 32-year-olds, our human babies are substantially our babies, are immature for much longer than the babies of any other species. And that actually seems to be our secret, our evolutionary secret. The reasons why we grownups with do as much as we can, can learn as much as we can, is that completely underappreciated fact that we're babies. And of course in order to success as babies, what that is means is having caregivers. So the only way this whole system can work is by having a maternal investment, by having caregivers who are actually investing in the baby's survival and success. So that's the kind of big evolutionary picture. There's even a new study that just came out looking at kangaroo species, and it turns out that even among kangaroos the more the parents invest in the babies, the greater the brain size of the babies, even for kangaroos, let alone for humans. Now, if this picture is right, you might expect that babies, in spite of being sort of superficially useless would actually be really well designed for learning because that's the baby's job. That's what babies are designed for. And we can show even from the perspective of their brains -- whoops. Sorry. Can we go back. Even from the perspective of just looking at their brains, all right. Back again. Did it work? Yeah. Yeah. Even from the perspective of their brains, we can see this aspect of their design. So these graphs are graphs of the number of connections between neurons, brain cells, as we develop. And what you can see from these graphs is that early on in life, we're putting together very, very large numbers of brain connections of these neural connections. And what happens is that as we get older what we actually do is strengthen the connections that get used a lot and prune, get lid of the connections that we don't use. So it seems that even from the brain perspective what's happening is that early on in development there's lots of possibilities, lots of different things that we could learn, lots of things to explore and that as we get older what we do is leave off the things that haven't worked and become very, very good at doing something. And you can see that this is different in different parts of the brain. So what the visual cortex, that first -- that first line, that's the part of our brains that's involved in actually seeing the world. And by the time we're a year old, we've worked out how to see the world around us. On the other hand, if you look at the part of our brain, the auditory cortex, that's the sound part that's responsible for language, that isn't finished being programmed until the kids are five, when they've actually started to learn, when they finish language. And the third part, the frontal cortex, that's the part of our brain that's sort of our chief executive office. That's the part that's responsible for long-term planning, action, as that part isn't actually finished being wired until adolescence. By 32 it's supposed to be done, but -- so during that early period, literally babies' brains are better at learning. They're more connected. Babies have more brain than grownups do in some sense. So what happens is we have this early period when computer scientists talk about a difference between an economist talking about a difference between a system that can explore and a system that can exploit. So an exploring system is a system designed to find lots of new things, be very flexible, have lots of abilities for learning, not so good at actually doing stuff. And an exploiting system is a system that's really good at doing one thing over and over again really well, not so good at shifting and exploring and finding something new. And babies seem to be designed to be explorers. They're designed to think of lots of possibilities, not be terribly good at doing any one thing, we're really good at doing a few things, not so good at changing our minds and doing something new. Okay. So if that picture of what the babies are like, the babies' brains are like, you might imagine that the babies would have fantastic learning abilities. And that's exactly what we've discovered. As I said, my previous book was called the scientist in the crib and we've discovered that babies are using a lot of the same techniques for learning about the world that great scientists are

using. So -- whoops, yeah. So how do scientists learn about the world? Well, one thing that scientists do is they use statistics. Now, any of you who have probably been reading the reports that are telling you about whether or not what you should be doing and how the statistical table will think, goodness, grownups can't understand about statistics. Statistics scare the daylights out of most grownups. It couldn't be that these tiny babies are doing statistics. But one of the really amazing things that we've discovered over the last 10 years is that even very little babies are already doing certain kinds of statistical analyses to an amazing extent. How on earth could we ever know that? Well, here's what we can do. Again, we can ask the babies in their language instead of our language. One of the things that we've discovered about babies is that babies like to look at things that are surprising or unexpected. So you show the baby the same old same old, the baby gets bored. Show the baby something that they think is not what they expected and they perk up and they'll look at this for a long time. And that's been one of the basic things that we've used to figure out what's going on inside of babies' minds. And this is an experiment that my colleague Fei Xu at Berkeley did to try to see if babies could understand statistics. And here's what happens. Play the video. Get the video. Play the video. So what Fei Xu does is show babies a box full of ping pong balls. And this is with nine-month-old babies. So there's the ping pong balls. They're mostly red with a few white. Sometimes. And sometimes what she use them is mostly white with a few red. And then the next thing she does is actually take a sample from that box. So what she does is take the balls out of the box. And what happens is that sometimes what she shows them is a sample that's mostly white. Okay -- sorry. Mostly red. So there's four red ping pong balls and one white ping pong ball. Now, okay. So that makes sense. Right. That box full of ping pong balls is mostly red and when we pulled out the sample it was mostly red, too. What happens if you saw that box and now what you saw is the mostly white ping pong balls were coming out of that box? Okay. Now, if you're a statistician and you see that pattern you say hey less than .05 significance, that could not have happened by chance. There's something else that's going on here, it couldn't just be a random sample. Well it turns out if you're a nine-month-old will look much longer at that event than they did at the event that was statistically expected. So nine-month-olds are looking at this very abstract statistical event and saying, wait a minute, I didn't expect this to happen, this wasn't the likeliest outcome given what I already know. And we'll get back to some of the other things that they're learning. This is just one of many, studies showing how sophisticated even these young babies are about statistics. Alison Gopnik: We wanted to try to do the same thing with slightly older children. So we've done these experiments with two, three, and four-year-olds. With two three and four-year-olds you don't just have to rely on what they look at, you can actually see what they do. And the way that we did this was we gave these children this very high-tech machine, it's called a Blicket Detector. It's a little box and it lights up and plays music when you put some things on it, but not other things. And two, three, four-year-olds this, fantastic, they're really happy to play with it, as we'll see in a minute. The way it really works is there's a graduate student behind a curtain who is pressing a button and making it happen. And the baby I told you about, the one who is now 230 pound, was a guinea pig in these experiments. And he went from months and finally I told him the answer was there was someone who was pressing the button. He said he felt like Neo in the Matrix when he realized this. Anyway, we've done dozens and dozens of experiment was this is and what we can do is ask two, three, four-year-olds statistical questions with this box. And let me just give you one example of an experiment that we've done showing -- can we get to the next slide? Okay. So what we did was we wanted to see if babies could learn something really new and unexpected about this box. Now, most of the time when -- if you saw this box and I asked you to make it go, what you would probably do is actually put one of the blocks right on top of the box. And, in fact, that's what most -- that's what most toddlers and preschoolers do. So they'll just put one block or another on the box. But here's what we did. We showed them different patterns of statistics between the blocks and the box. So here's what the children saw. They saw that the red block made the machine go to -- sorry, you can't quite see the going off. But the red block makes it go two out of three times, okay, so it makes it play music two out of three times. On the other hand, the blue block only makes it go two out of six times, okay? But the red block doesn't actually make contact with the box and the blue block does make contact with the box. So what we were doing was taking something that the children thought to begin with, which was that you would have to make contact to make the box go, and we were actually giving them a little bit of statistical evidence that said, no, actually the red one is more likely to make it go than the blue one. Now, notice, we did this experiment with two and three-year-olds and they're having to figure out that two out of six is less probable than one -- than two out of three is. So these are three and four-year-olds. They're just barely starting to add and subtract. But to solve this problem, they would have to in their heads be doing this pretty complicated mathematical calculation. And of course we couldn't ask them which do you think has the higher conditional probability, but what we could ask them is make the box go and when we asked them to make the box go, they chose the red block over the blue block. So again, these tiny little children were using this quite sophisticated bit of math to figure out how the machine around them worked and they were just doing this completely spontaneously without any tuition from anybody else. So again, like scientists these

children are doing these statistics. Another thing that scientists do to try to figure out how the world works and like scientists just sort of doing this for the sake of figuring out how things work, another thing that scientists do is they do experiments. And we think that babies and toddlers are also constantly doing experiments, except that when they do experiments we call it getting into everything. And here's an example. There's been lots of beautiful work about children's experiments in play recently so we think when children are just playing, which is something they are doing all the time, what they're really doing is doing experiments to figure out how the world works. And let me show you a clip from just one experiment, Christine LeGare at University of Texas at Austin, did and experiment where she took our Blicket Detectors, and she showed the children that blocks of one color made the detector go, the red ones made it go and the yellow ones didn't. And then she showed them something that didn't seem to make sense. She showed them a red block that didn't work. And she just asked the children why did that happen? And can we see the video? And here's what the -- here's the sort of thing the children did. This is a three-and-a-half-year-old. [Video played]. Alison Gopnik: That's his suggestion, by the way. He asked her if he could do that, try that next. [Video played]. Alison Gopnik: Okay. So of course this is as Christine says, this little boy is kryptonite cute, he is amazingly cute. But he's not exceptional. In fact, what she found was very characteristically if you just show the children something that didn't seem to make sense and then said why did that happen, just as you'd expect from hanging around with three and four-year-olds what they would do is play and try things out and eventually they would actually figure out how the machine worked. And in the course of doing it, you could see it's really nice for this little boy because he's so talkative and articulate, but even with less articulate children what you would see is that they are trying out different kinds of hypotheses just like scientists about how it is that this block worked. And they were doing it just as part of their spontaneous curiosity and exploration and play about what the word was like. In another experiment, this is one of my ex-students Laura Schultz who is now at MIT, did an even nicer, more systematic experiment to show this. What she did was to give children this little box and again this is with preschoolers and toddlers. And here's a box that has two levers on it. And what happened is in one condition what happened was that -- so the question is when children play, are they really trying to figure out how something works? So in one condition what happened was that the children saw you push down two levers and these two little toys pop out from the box. And do you that several times. So push down -- the experimenter and the child both pushed down the lever at the same time and the little toys pop up. Okay. In the other condition, it's almost the same except this time the experimenter pushes down the lever and one toy comes up and the child pushes down the other lever and the other toy pops up. Almost exactly the same situation except that the first time you don't know how the toy works, right? It could be that one lever works. You don't know exactly what's going on, how that toy is work. The second one, now you do know how the toy works. Okay. And then what she did was to show them just leave the room, leave the children with the toy an then show them another toy, a new toy. And the question is what would the children play with? And what Laura Schultz discovered is that the children, even the two-year-olds, would play more with the more mysterious one. So if they had the toy that they couldn't understand, where you couldn't figure out how the levers worked, they would sit and play with that toy, ignoring the new toy until they figured out how it worked. But if they already knew how the toy worked, if the problem was already solved, then they would go on and try to solve -- try to play with the new toy. So just something that again looked completely spontaneous.They're just spontaneously figuring out how these toys work. They're playing by themselves, there's not even an adult in the room. The children were behaving like good scientists. They were saying I can't solve this problem, I'm just going to keep doing experiments until I do. Or else they said, I know how this works, I'm just going to go on and do the next experiment in the grant proposal. So even these very young children were already acting in ways that let them figure out how the world worked. I think for the next one I'll just describe it rather than doing the videos in the interest of time. This is another experiment from Laura Schultz' lab. And I think this is an important one. What she did here was show the children a toy that had four interesting things that it could do. And it had a squeaker. You press something else and you got a light. There was a mirror on one end and it played music. And what she did was in one condition what would happen -- so the grownup comes in, the grownup has the toy, the grownup puts the toy down on the table. And in one condition what the grownup did was just say, gee, here's my toy, I don't know how this works. Maybe lets see the first part of this video. [Video played]. Alison Gopnik: Okay. Could we just go straight through to the next video? So the first time what she did was she just -- actually, let's hold on before we do this. What she did was she just acted as if oh, well, there's this weird thing that happened. Then she just let the child have the toy. And what the children did in that circumstance was play with the toy until they figured out all the different things that the toy could do. They would figure out about the squeaker, they would figure out about the mirror, they would just explore everything trying to figure out all the weird things that this toy could do. So here's the other condition. Now could we have the video. [Video played]. Alison Gopnik: Okay. We can stop the video. Because basically we can stop the video because all he did was push that squeaker. So what happened in that second place is

that the adult came in and said this is my toy, I'm going to show you how it works, I know how it works, and when the experimenter did that, all the children did is do what the experimenter had done. So in some ways that's a good thing. It meant that was a very quick way so the children could tell, okay, this is a teacher telling me something, I'm going to do what the teacher has shown me. And in some ways that was good. The children found out about the things we wanted to teach them. But those children didn't find out all the other thing the experimenter hadn't set out to teach. So in some way the people doing this have called it sort of the curse of pedagogy. So the idea is when we are too much emphasizing the specific things that we want to teach a child, we might be missing the kind of exploration and curiosity and play that actually lets especially infants and toddlers and pre-schoolers learn all the new things around them. So it's not that it's useless, it's good to have experimenters who are teaching, and it's really interesting that the children are so sensitive to whether or not someone is trying to teach them something. But there really needs to be a balance with these very young children between trying to teach them and letting them explore. The ways that they're really fulfilling the research and development part is by exploring all of these possibilities and by treating them as if they're like school children where we have a set number of things we want to teach them, we may be narrowing the kind of intellectual possibilities that we saw before. So I think that's a really important thing to say. So those experiments are, one set of experiments that are showing that when children are doing these things that are just spontaneous play that often don't show up in the assessments or in the, you know, standardized testing, that's when they're actually learning the most. One of the things that is most important for children to learn about -- so so far I've been showing you children learning about toys and Blicket Detectors, but the most important things that babies could ever learn about is about other people. We're the most important things for them to learn about. And one of the things that's been most amazing over the last 30 years is that we've discovered even the very youngest children are already learning a tremendous amount about the minds of the other people around them. And they're doing this literally from the time they're born. So if you think of them as being little psychologists we're the lab rats. They're out there trying to figure out how our minds work. And let me just again just give you one experiment from many experiments that have been done on this. This is one that we did in my lab. And what we wanted to do was to find out whether babies were really as egocentric as everybody thought they were. And again, Piaget said that babies couldn't take the perspective of another person until they were eight or nine years -- children couldn't until they were eight or nine years old. We thought maybe that was because we weren't asking the babies the questions the right way. So we wanted to see something very basic. Could babies understand that someone else could really want something different than they wanted themselves. Which is kind of hard even for adults sometimes to understand. In Washington I expect you will be especially aware. [Laugher]. So instead of, you know, doing an opinion poll what we did was we showed children two bowls of food. And we did this with 14-month-old and 18-month-old babies. One bowl of food had raw broccoli in it. The other bowl had Pepperidge Farm goldfish crackers in it. And even in Berkeley all of the babies like the crackers more than they like the raw broccoli. I'm very proud of the fact that my books have been translated into all these languages. We had a wonderful exchange with the Italian translator about this passage in the book. Because first of all we have to explain why American children like to eat little fish, which seemed really weird, and then I had this joke about Berkeley so I had to explain that there was a place where people thought you should eat things because they were healthy but didn't taste good to an Italian. And you know, the Italian audience was not going to get raw broccoli. But anyway what we did was all the babies liked the crackers instead of the broccoli. Then what we did is we showed the experimenter taking a little bit of food from each bowl and either making a disgusted face or happy face and we foe that even babies understand about emotional expressions from the time they were a few months old. So Betty who was the experimenter would take a little bit of food, and sometimes she'd act as if she liked the same things as the baby liked. So she would take broccoli and sensibly she would go yuk, broccoli, ooh. And she would take crackers and go, um, crackers. But half the time she would reverse it. So for half the babies she would go um broccoli, and yuk, crackers. Then what we do is give the baby both bowls of food, and Betty would put her hand out and say can you give me some. All right. Here is the question. What will she give her? Will she give her what they like, the crackers? When she acts as if she likes the broccoli, will they give her the broccoli? And what we discovered was that 18-months-old babies would give her the crackers if she liked the crackers and would give her the broccoli if she liked the broccoli. So these 18-month-olds who are just walking and talking could recognize that another person might have a different perspective, first of all, and secondly they thought if someone wanted something else, then the thing to do is give them what they want. And that actually fits with a lot of new studies that show that even 14 and 15-months-old are altruistic. They'll already do things in order to be able to help the people around them. And I can talk about that some more in the discussion. So they already have a sense, the morality in the sense of help people to get what they want, not necessarily what I want for them. The other thing, on the other hand, was that the 14-month-old babies didn't do this, the 14-month-old babies looked much longer when she acted as if she liked the broccoli, like remember with

the ping pong balls, this is weird this is really unexpected. But they just gave her the crackers. So not only were the 18-month-olds taking the perspective of someone else but they had somehow learned to do that between the time they were 14 months and the time they were 18 months. So something that happened in there was actually teaching them about this perspective taking of other people. How could the babies actually be learning it? Well, again, go back to what I said before. We think that the babies learn -- use statistics and they also do experiments. And let me tell about you this beautiful experiment that another of my students, Tamar Kushnir did. Remember the ping pong balls? All right. You can take the same idea as the ping pong balls but now you do it with little green frogs, little toys, green frogs and yellow ducks. And what the baby sees, this is the 20-month-old babies, is the baby sees two bowls, one bowl mostly of frogs, one bowl mostly of ducks. And then they see the experimenter take some of the balls out of the bowl. If one condition what they see is mostly green frogs, and the experimenter mostly takes green frogs out. In the other condition what she sees is the bowl that's mostly yellow ducks, but the experiment carefully out picks just the green frogs. There's a few green frogs mixed in and she just picks out the green frogs, sort of like you know, the rock star just eating the black M and Ms, right. Just -- she just picks out the frogs. And then they, just like in our broccoli experiment, the baby gets two bowls, one of frogs, one of ducks and the experimenter says can you give me some? Now, if you think about it from a statistical scientific point of view, when someone picks green frogs out of something that's mostly green frogs that could just be random. But if they go in and just pick green out of a bowl that's mostly yellow ducks, they couldn't -- that isn't just random, that isn't something that would just happen by chance. That must mean that something is going on. And the most likely thing that is going on, is, well, they like the green frogs. Sure enough, when you do this with 20-month-olds, in the first case where it's just random, mostly green frogs from a mostly green bowl, the kids will be at random in giving the adult frogs or ducks. But if what the experimenter did was unlikely statistically, mostly green frogs from mostly yellow bowl, they would just give her the green frogs. So again, 20-month-olds, not only are they picking up these statistical patterns, but they're using them to make an inference to figure out something about someone wants. So it looks as if the way that the children are learning is by looking at what the people around them are doing and drawing conclusions based on even really subtle things like the statistics of what people are doing. We think that the babies are also doing experiments in this period except that these experiments instead of being -- instead of being getting into everything experiments are what we call the terrible twos. So the terrible thing about the terrible twos is not that children do what you don't want them to, at least until they're 32 they do things that you don't want them to, it's they do things because you don't want them to. And that can be incredibly frustrating for parents and caregivers. But if you think about it from this scientific perspective if the children are just starting to understand I might want something different from what you want, then it makes a lot of sense to do experiments about this. And when you watch babies in the terrible twos, they really do often look like little, you know, mad scientists where they're sort of saying okay, let's see, finger goes three inches away from face, steam begins to come from mother's ears, and finger goes one inch away and the top of mother's head starts to quiver, and touch face and mom explodes. So they really seem to be, at least part of the terrible twos is a way of experimenting I want one thing and you want another thing, what's going to give, what's going to happen, what's the result of that actually going to be? Another way that we think that -- we think that babies and young children are figuring out about other people's minds is through their pretend play. And as you know, by the time babies are 18 months old, they're starting to pretend. And by the time they're two or three, they're spending 24/7 off in these wild, imaginary worlds. And it's again one of these puzzles why would children be spending so much time off in these strange imaginary worlds? Why would they be pretending so much? And one of the really dramatic and interesting kinds of pretend play that you see is that children will actually start developing imaginary friends when they're two or three years old. And this is actually -- this is actually Jimmy Stewart's imaginary friend Harvey, the six foot rabbit. And it's kind of unusual for grownups to have imaginary friends but it's pretty much standard practice for typically developing preschoolers. And there's a wonderful book by a psychologist Marjorie Taylor called Imaginary Companions and the Children Who Create Them about children's imaginary friend. These are a pair of siblings who actually shared the same imaginary friend. And if you actually read about imaginary friends sort of in the popular culture there are sort of two kinds of stories about imaginary friends. They're either scary like you know Jack Nicholson or they're funny like Harvey. In my own life I have two good stories, one scary and one funny, one about imaginary companions. When I was actually growing up and I was a baby, I had an imaginary friend when I was about two and a half called Dunser, except that he wasn't a friend, he was an imaginary enemy. He lived at the end of my crib. And he was scary. And it was never quite clear what evil thing he was going to do, but like in any good horror story he was just evil, as my mom told the story. And it got to the point where I was so scared of Dunser that I wouldn't get in my crib. I would point and say I'm not getting in there if he's in there. So they went and they picked up my younger brother, who at that point was 18 months old and my mom said well, why don't you just swap cribs with Adam. And I said that's fine, Dunser is never in Adam's crib,

he's only in my crib. And she went to pick up Adam as soon as he saw my crib pointed to the stop where Dunser was and started crying and holding on to my mother and refusing to get into the crib. Now, maybe not coincidentally that brother grew up to be a writer and he actually lives in Manhattan, he writes for the New Yorker. And his daughter had an imaginary friend. She was three. Her name was Olivia. And her imaginary friend was called Charlie Ravioli. And the distinctive thing about Charlie Ravioli was that he was too busy to play with her. So she would say things like I went downtown, I bumped into Charlie today at the coffee shop but he had to run. And she would leave messages on his imaginary answering machine. So she would say Charlie, it's Olivia calling, could you get back to me, and then she would hang up the phone and she would say I always get his machine. [Laugher]. So that's a funny story about life in New York. But it might also actually be informative because what -- now, when my mom told the story of Dunser, or when Adam tells the story of Charlie Ravioli, we sort of implied that our children are either smarter or crazier or both than other people's children. But it turns out that having an imaginary friend is not particularly a sign of being especially smart or especially crazy. Marjorie Taylor found out about 70 percent of three and four-year-olds had an imaginary friend. The interesting thing was those children weren't more lonely, in fact, they were more sociable than other children. They weren't smarter. But one thing that was different was that they were better at those tasks that involved figuring out someone else's mind, like the broccoli and goldfish. So they were better at figuring out what was going on in somebody else's mind, what someone else would think, than the children who didn't have imaginary friends. And in general the amount of pretend play that children do, how much pretending they do, this thing that looks like it's kind of just crazy and useless turns out to be a very good predictor of how good they are at social and emotional intelligence, how good they are at figuring out what other people are like. And if you think about something like Charlie Ravioli, aside from being a funny story, what children seem to be doing with their imaginary friends is figuring out if I had a friend, here's what they would be like. Here's what people in New York are like. If you want to have a friend in New York, you better make sure that you have a big rolodex and have lots of possibilities for checking your diary. So these very young children with their imaginary companions even though it does look like play, just like messing around with a Blicket Detector just looks like play, that play is teaching the children really deep important things about how the other people around them are. The one group of children who don't have imaginary friends and don't show much pretend play are children with autism spectrum disorders, children who aren't very good at figuring out how other people -- how other people work. So yet again, the message is, you know -- and I think this is happening in say nurseries and preschools where people are saying let's, you know, not waste time in the pretend corner, let's have them in reading drills, what those children are doing when they're pretending is part of this evolutionary program by which they're exploring all the possibilities about the ways people could be. Now, probably the most important thing about people that babies and young children are learning is they're learning about how love works. One have the most important things. Because babies depend on caregivers to take care of them and human babies I should emphasize depend not just on mothers but on a wide range of different caregivers, we have lots of different information for that. Babies were really designed to be taken care of by the village, by lots and lots of people. Babies need to figure out how love works. What happens? How can I get someone to take care of me? What happens in this intimate relationship with a caregiver? And we've known for a long time that different babies seem to learn different things about how love works. And this comes from the literature on attachment which I imagine a lot of people here have heard about. If you look at different babies and different combinations of mothers and babies what you'll see is for example some babies when the caregiver leaves, this is when babies are about a year old, the caregiver leaves, the babies get upset, they cry, and then the caregiver comes back and the baby is really happy and they have a big happy reunion with the caregiver. On the other hand, there are some babies that when the caregiver leaves just act as if they don't care; in fact, they'll turn away and not look at the babies -- look at the caregiver. And one of the saddest findings I know in psychology is that when you measure that baby -- those babies's heart rates and skin, underneath they're incredibly stressed so their hearts are racing and their palms are sweating and they're showing all the signs of being very upset, but these 18-month-olds have already learned not a good idea to show how upset you are, it's better to actually play it cool and act as if you're not upset. And when the mom comes back those babies also are just acting as if they're not upset; in fact, they'll turn away from the caregiver when the caregiver comes back. Still other babies get terribly upset when the caregiver leaves, and they're sort of inconsolable when this caregiver gets back. These are the anxious babies. And the babies that seem to be worse off in terms of their outcomes are the babies who haven't figured out any way of acting at all, who do lots of different things and don't seem to have a consistent way of reacting. And we know from years of research that these different attachment styles, these different ways of understanding love have consequences later on for how people function even when they're adults. But what I want to talk about now is some really great experiments which actually show that babies are learning this from the things that they see around them. And these are experiments that Susan Johnson, who was at Stanford and now is at Ohio State

has done. And what she did was take that technique, this habituation technique, exploited the fact that babies look longer at things that they think are surprising. So here's what she did. She showed the babies little videos like this. Do you want to play the video? So here's what the babies see. So the babies see a big kind of mama ball and a baby ball. Okay? They just see that over and over again. So they see the mama goes away, mama ball goes way and the baby ball place. So after they've seen that, here's what they see next. Next video. So sometimes here's what they see. Okay. But sometimes half the time they see this other video. Next video. So sometimes they see the caregiver going to the baby that's crying. And then times they see the mama ball going away from the crying baby ball. Now, here's the remarkable finding. If you show these videos to secure babies, the babies are more surprised when the mom goes away than when the mom comes back. So they expect the mom to kind of comfort the baby. You show those videos to insecure babies, avoidant or anxious babies, just the opposite pattern. Those babies are more surprised -- the avoidant babies are more surprised when the mom comes to the distressed baby than when the mom goes away from the distressed baby. So those avoidant babies seem to be predicting if you cry, mom's not going to come and take care of you, if you cry, mom's going to go away. And so these 18-month-old babies already seem to have made -- learned something about how care giving works and are making new predictions about what will happen both to them and to other babies. And I think I'll skip through the videos in the interest of time. But she did exactly the same experiment but now with -- but now with the baby approaching or withdrawing. So either the baby came -- the baby cries. Does the baby go to the mother for comfort or does the baby go away from the mother? Same thing. The secure moms -- the secure babies think that the baby will go towards the mother and the insecure babies think that the baby, when the baby is in distress will go away from the mother. So one of the other things that babies are learning very early on, perhaps the most important thing, is they're learning about love. They're learning about what it means to be in a close, intimate relationship with another person. Again, incredibly important thing to learn. Reading and writing are great, but learning about love is the crucial thing that you need to learn if you're going to be a successful adult. Okay. The last thing I'll talk about is the question that in some ways is like the biggest question for me as a philosopher, which is what is it actually like to be a baby? What is baby's consciousness like? What's their everyday experience like? And it might seem as if that's the sort of question that you couldn't possibly answer. How could you know? And, in fact, if you had read those philosophers and psychologists for all those years, a lot of them would say things like that babies weren't conscious at all, they were just like little automata. And, in fact, for a long time, when they did operations on very young babies they didn't give the babies anesthesia, because they didn't think the babies actually feel pain. And there actually are still issues about whether babies are getting sufficient anesthesia. So what is it actually like to be a baby? What's a baby's consciousness like? Well, what I've argued is I think babies are more conscious than adults are. And here's the reason. If you look at your adult consciousness we actually know a lot scientifically about what makes adults conscious. So here's basically the way the story goes. For a grownup, if you pay vivid attention to something, pay vivid attention to one thing, you're really, really conscious of one thing, so if I'm looking at that chair, I really, really, really see that chair. And everything else around you sort of fades away and disappears. And we actually know something about how your brain does that. So if I'm paying attention to something, my brain literally those frontal parts of my brain squirt a chemical onto my brain called acetylcholine, and it actually makes that little part of my brain work better. It makes it more placid, more flexible, it makes it easier to change. And at the same time I squirt these other chemicals, inhibitory chemicals on the rest of my brain that actually makes them less change. So it's kind of like the adult strategy is if it's not broke don't mess with it. Just change the part of your brain that you need to that's important that's relevant, leave the rest of your brain alone. We also know as adults that if I pay attention to something and then I get used to it, I get less and less conscious of it, right in so I do something over and over again, and I just lose consciousness of it all together. Now, when we look at babies, babies' attentions and babies' brains work quite differently. So if you look at babies attentions, babies are really not good at just focusing on one thing, especially not one thing that's important that they decided to pay attention to. So we say that babies and young children are bad at paying attention, what we really mean is they're bad at not paying attention, right? So they're great at paying attention, it's just that they're paying attention at everything, not just the one thing that you want them to pay attention to. And it turns out that if you look in babies' brains what you see is that their brains are just bathed in these transmitters, these cholinergic transmitters that we just have a little bit of when we're vividly conscious of something. And they don't have those inhibitory transmitters that shut off parts of their brains. And if you look at what they pay attention to, you can see the same thing. Well, how can you tell what a baby is paying attention to? Well, let me show you a result of some studies by Scott Johnson and Ed Vul. And how could you tell? Well, you could look at their eyes, see where their eyes are going. So what they did was they got a machine that actually tracks their eye movements, sees where your eyes are moving. And all those little blue crosses on there are grownups' eyes as they're looking at this little video. So here's what a grownup does. You show the grownup this picture and you can see that all the grownups have

already pretty much decided that Charlie Brown is the thing they should be looking at. Can we play the video. And as the video goes forward, they move over a little bit to Snoopy, but basically they're still staying on Charlie Brown. Now, here's what happens when you get to -- sorry. Can you get to the next slide. Here's what happen when you do the same thing to six-month-old babies. To begin with, the babies are sort of all over the shot, so in a whole lot of things in the picture. Can we play the video? Now, as the video goes on, it's not that the babies aren't looking, they are looking, but they're willing to look at much more of the picture than the grownups. So they're not just looking at Charlie Brown, they're looking at all those interesting Christmas lights and they're looking at the edge of the house and they're looking at Snoopy. So literally they're seeing more, they're paying attention to more of the scene than the grownups are. So the babies actually seem to be seeing more than the grownups are. Now, they're not as good as deciding. I'm going to look at just this one thing and leave everything else out. What they seem to be designed for, and go back all the way to the crow, what they seem to be designed to do is learn as much as possible around them and they're paying attention to as much as possible around them. So I think that -- get to the next slide, the last slide. So I think that if you think about adult consciousness as being like this spotlight that comes in and just narrows in on this one thing, the babies' consciousness is like a lantern. So the babies are living in this world where everything around them is illumined and important and significant and vivid. If you want to get a sense of what it would like to be a baby. I think you should think about what happens when you go to a new country. So say you go to Paris or Beijing for the first time and everything around you is new. There's nothing that you're used to. Everything around you is vivid and alive and aware. And you don't even know what to pay attention to. You're learning about everything at once. And, you know, you can go for months in your everyday life at home, you know, going to work and going to faculty meetings and driving and basically being a zombie, having no consciousness of any of this, which in the case of going to faculty meetings is probably a good thing. Then you go to Paris for three days and suddenly you've got more consciousness in those three days than you've had for the six months when you were just having your regular life. So I think that what it's like to be a baby is like being in Paris. And it turns out that remember those chemicals I told about you, well this is kind of bad news but those choleragenic chemicals are the chemicals that are in cigarettes. So when people say that smoking actually makes you pay better attention, they're right. It kills you but in the meantime you actually have better attention. And those inhibitory chemicals that I talked about when you have coffee and caffeine as you probably already of done this morning, it gets rid of those inhibitory chemicals. So you want to know what it's really like to be a baby. Being a baby is like being in love the first time in Paris after you've had five double espressos and a pack of gowasses, right? That's basically what it's like to be a baby. And that's a fantastic way to be in lots and lots of respects. Everything around you is really vivid. You're going to remember that time as being a great time. But it does mean that you tend to wake up at three o'clock in the morning crying, right? [Laugher]. And, in fact, we think the waking up at three o'clock in the morning crying part indeed is relevant to that. So what's happened is that part of the reasons why babies are sleeping so long is that that's the time that they're sorting out this incredible amount of information that they've had to take in during the day. Which might make you a little more sympathetic to the colicky baby at three o'clock in the morning. Okay. Let me end up. So what have we learned from all this? What we learned is that the pictures that so many people had of babies as just these, you know, burping little machines that had to be -- have their physical needs taken care of, just the opposite of what all of our science tells us. What all of our science tells us is that babies and young children are learning more in that period than they are will again in their lives. And one of the things that I often say is we put and enormous amount of money in educating people between the ages of 18 and 24, and I'm glad of that, because the state of California -- I used to say they pay my salary, now they sort of pay my salary, but still the state of California invests millions of dollars, billions of dollars into educating people into 18 to 24. We put almost nothing into educating people between the ages of zero to three. And, you know, Sannon was talking about how we're only doing this for a tiny percentage of all the babies. And as a scientist I can tell you that every baby learns more than during the ages of zero to three than learns probably hundreds and thousands of time more than they do between the ages of 18 and 24. And that investment that we need to make in those babies, again, remember the slide about the chickens and the crows, crows know that -- crows and kangaroos know that in order to be able to do all that learning, you have to be able to take care of those fledglings, you have to invest in those fledglings. Let me give you a last example of this. There's a fantastic move which I highly recommend to everybody, called Nonic of the North. And it's actually about an Inuit family in the 1920s growing up in the frozen north. And this family is on the verge of starvation all the time. They're just barely getting along. But when you see this film, halfway through the movie the dad stops and makes a little toy sled for the baby. And they have a snow fight. They actually sit and they play with the sled and they play in the snow for a while. Now, you might think, wait a minute, these people are just barely subsiding, he's taking the time to make a sled and sit and play with this baby. But what that Inuit dad seems to know is that that's the way that the next generation is actually going to survive. The way that you survive if a

challenging environment is by teaching the next generation of babies and remember those slides about play, the way you teach them is by giving them a sled and letting them play in the snow. So that Inuit father seems if you sort of work out what the gross national product is for that Inuit family and that Inuit village, they're putting a tremendous percentage of that into the play and life and love of those little babies. And I think if we put a 10th of the percentage in the wealthiest in the history of humanity into letting our babies be taken care of and love and play, we might expect that our next generation would do a better job of dealing with the future than they probably could do now. [APPLAUSE]. And of course that's what all of you her are doing. So thank you all very much. [APPLAUSE]. Lillian Sugarman: Thank you, thank you, thank you. That was lovely. Let's give Alison one more round of applause. That was wonderful. [APPLAUSE]. And several of you are lucky enough because Alison has agreed to do breakout session and several of you have tickets for it. If you don't have tickets for it, you might be feeling sorry. But you can't get in the room anyway. I just you want to make and announcement or two. Folks, there's a beverage break. Please don't stay here. Move to your rooms. There are beverage stations outside the Thurgood Marshall room, outside the Washington room and outside of the Delaware, Virginia, Maryland room. So please get your beverages and go there. And when we gather again together in this large room, no sitting on the floor or the steps. The fire marshal already called me on my cell phone and left me a text message. Lots of seats in the front. Please take them. Enjoy the conference. --End of Video--