# Researcher Transcripts – Science of Early Child Development – Introductory Edition

This document contains transcripts of the expert interviews in *The Science of Early Child Development - Introductory Edition*. Transcripts are listed alphabetically by the name of the interviewee and the name of the video clip. Click on the name below:

| | | |
|---|---|---|
| Alexander | Gunnar | Mustard |
| Alvarez | Halfon | Nelson |
| Barr | Hertzman | Niles |
| Battle | Heyman | Pascal |
| Battle and Walden | Janmohamed | Pelletier |
| Bennett | Janus | Peters |
| Bhutta | Jenkins | Prentice |
| Black | Jones | Roos |
| Blackstock | Kaiser | Rundle |
| Brownell | Katz | Rutter |
| Brownell and Butler-Jones | Keating | Santos |
| Brussoni | Kershaw | Shanker |
| Butler-Jones | Kidder | Soderstrom |
| Clinton | Kolb | Sokolowski |
| Corter | Lee | Sparling |
| Durrant | LeFevre | Stanley |
| Favreau | Levine | Tremblay |
| Favreau and Kidder | Marvin | Warner |
| Fourre | Mikki Adams | Werker |
| Furman | Mirabelli | Williams-Ridge |
| Guhn | | Zelazo |

## Alexander – economic benefits (2:41)
Developmental Health - 2.3 The economic impact

Investment in Early Childhood Education is actually a very strong investment. I actually think it has enormous returns for the children, for parents, for the economy and for society. I think it actually has very far-reaching benefits.

And one of the things you look at, because it would come, you know a national program, would come with a very high price tag. One core question would be what's the return on the investment going to look like. And there's been a number of studies done and the literature is absolutely compelling that the rate of return is actually quite high. You know, the estimates range from everything from every dollar invested gives you a return of $1.20 all the way up to $3. And I think that what that demonstrates is that, while it is an expensive proposition, it can actually create enormous benefits to the economy and society as a whole.

So, when we think about the benefits to children, we know that cognitive development starts immediately after birth. That means children are learning right away. Why did we decide the public education system would start at age five when in fact we know children start learning immediately. There's benefits to the children. It helps their cognitive development and it helps their social development. It also brings very big benefits to parents. It reduces stress on parents. It helps work-life balance. It can also help increase labour participation. We've seen this in terms of Quebec where labour force participation amongst women increased measurably.
By creating a more skilled group of individuals, you help to deal with core social issues like poverty. So you can actually tie Early Childhood Education and the benefits of Early Childhood Education to a lot of economic and social issues. And it can help you actually save money on those programs if you actually invest into children early.

So people often wonder why a bank economist would be talking about Early Childhood Education. But in fact, it's part of skills development and it's about having the labour market that can meet the demands of the economy in the future. If you think about our economy, we ultimately are going to compete on the basis of our trained and skilled labour. You know, if we try to compete with places like China on wage costs, we're going to lose. So, we need to build a better product. We need to be more innovative. We need to have a more productive economy. And you can't have that without workers with effective skills.

So, I'm a very strong advocate for literacy, for numeracy, for social skills development. And when I think about Early Childhood Education, it is about education. It's about skills development. So, while it might be counterintuitive to have a banker talk about Early Childhood Education, in actual fact, this is an economic issue.

## Alvarez – Tumiralaat child care centre (1:41)

Ecology of childhood - 3.3 Creating child friendly communities

Tumiralaat was a childcare centre that was started in 2008 for supporting children through city subsidies and supporting the parents who are trying to get back to an education, improving their education or wanting to join the working force.

Tumiralaat has been now operating a toddler program starting at 18 months of age, a pre-school program and we run concurrently with a kindergarten program that we do in partnership with the Ottawa-Carleton District School Board.

What makes the centre unique is that we are Inuit specific. We are serving Inuit families that have come here from the four different regions that make up the Nunaat, the land-based claims that have been awarded to Labrador, Northern Quebec, Baffin and the Northwest Territories area. And we work with different dialects but we try and serve the families as best we can in an urban centre that's basically surrounded by a mainstream culture. So our importance is to keep the culture strong, try and keep the language strong, trying to keep our families strong.

## Alvarez - Tumiralaat programming (3:39)
Ecology of childhood – 3.2 Strengthening early child development programs

Our programming has to be reflective of the children and what they know and what their backgrounds are here living in Southern Ontario. So, we can't be denying that, we have to be able to walk the two cultures. And it's always a challenge on how we adapt our activities and be mindful that we are here to support the Inuit culture. So, part of what we do here is we always look to the IQ principles and the values and we look to see that the children are reflecting the attitudes and beliefs of honesty and respectfulness and perseverance and generosity. All of these are values that are universally accepted but to realize that the Inuit also have these values as a base on which to interact with one another.

It's about making our programming bicultural in that we have to reflect what the children know here and also build in some traditional ways of play that were used up north. So traditionally, you'd be using bones, you'd be using stones, you'd be using furs like from different animals, you could be using a bird's wing. There'd be things that would be handmade as traditional toys. So, making the bones into something that we can play with, something that we can build with, something that will develop a skill. So, by using the bones as loose parts or using pinecones as loose parts or using more natural materials.

So, we've incorporated the seal skin. We can pretend that we're scrubbing it down because the skins used to need cleaning, so we have it in the sensory table with soap and water. We also had the ulus and the savics, which are the woman's knife and the men's knife. They are traditional tools that were used in everyday life. And so we're using it at the Playdoh table so the children are learning all the manipulation skills that they would use using tools down here in the south. But we just adapt it and you can see the children the way they manipulate the ulus, it's been a familiar object that they've seen and used.

In the activities and also in the play space itself, it's important that children see themselves reflected in the images that we have, in the books that we have, in the stories that we tell. That the children can be proud of who they are, have a sense of what it is like being up north in a land with no trees versus coming down here and having a different experience of what seasons are down here versus what things are like up north. So, we use a variety of resources. We use the books, sometimes we use videos and quite often we lead children in songs so that they can imagine that they're actually driving a dog team and they're going out hunting and that sort of thing.

So, there's a way of incorporating the two cultures because people do feel home sick from time to time. But they want to be able to see that somehow the basis of their culture is being reflected in their children.

## Barr – infant crying (1:50)

Coping & competence - 2.1 Early regulatory systems

That's a terrific question about infant crying. We have essentially very little idea about why some infants cry much more than others. Except for some very obvious truths which is that there's hardly a behavioral or a biologic or morphologic characteristic that we know about in humans or any other species that doesn't have a huge range of variation and why we shouldn't expect that for crying is really not such a surprising answer in a way. There is a huge variation in height, there's huge variation in skin color, there's huge variation in all kinds of functions that we know about. And there's huge variation in the amounts infants cry. Interestingly, anything that has a huge variation like that has context in which it can be beneficial and context in which it's not beneficial.

So we can illustrate that by the wonderful story of Martin deVries' observations in the Masai infants where he took a sample of infants and rated them according to temperament characteristics and then came home and found out that just like in North American infants you have some infants that cry a lot and some that cry less. The ones that cry a lot are called difficult temperament infants and the ones that cry less are called normal or slow to warm up infants. And then when he was away from the Masai they happened to suffer from famine that occurred during the winter and he went back the next summer and looked up all of the infants and as you might expect from the context of the story that I'm telling, the infants who were the difficult crying infants were more likely to have survived the famine. In that context crying a lot was life saving for those infants, relatively speaking.

**Barr – pre-birth memory (2:39)**

Brain development - 2.3 Memory

Well the experiments about why and how infants learn in the womb are quite wonderful and there's a whole series of them. But let me just describe to you one of the more famous ones which is called The Cat in the Hat Experiment. And The Cat in the Hat refers to the story that Dr. Seuss wrote. And these investigators, DeCasper was one of them and Pfeiffer was the other one, had this brilliant idea of having mothers read a passage from The Cat in the Hat to their infants in the womb in the third trimester of their pregnancy. And they did that, I believe it was three or five times a week for about 15 minutes per time; it wasn't a very long time reading. But they did it repeatedly in the later weeks of the pregnancy. And then when the babies were born the infants were fitted with headphones. You can imagine sort of infant headphones. And they had a pacifier put in their mouth that measured the amount of pressure of sucking that the infants did when they sucked on the pacifier. And when they hear something familiar they tend to suck with more vigour and more quickly.

And this allowed the investigators to do an experimental manipulation which is always the gold standard for everything we're trying to do when we study infant behavior. And they were able to selectively feed back to them through the headphones their mothers reading the same Cat in the Hat passage that had been read to them, so to speak, while they were in the womb during the third trimester. Or a control passage which wasn't The Cat in the Hat which was another passage of equal length and also read by the mother. And the interesting results were that it was only when The Cat in the Hat passage was read back to them that the increase in intensity and speed of sucking occurred. Which was pretty impressive evidence of the fact that they recognized the passage that they had been read to prior to the birth experience.

And now there are many, many studies out there that have used similar techniques and with other kinds of stimuli and it's not limited to reading or anything about The Cat in the Hat particularly but a lot of stimuli that infants are exposed to, in a sense, in the womb earlier, can be demonstrated to have been remembered later. So it's become a wonderful example of what is generally referred to as learning in the womb.

## Barr – PURPLE crying (5:13)

Coping & Competence – 2.1 Early regulatory systems

You know, I must get asked that question about how do you get through this early increased crying period more than any other question in my whole professional life. There's probably no more compelling question once people find out that I have any interest at all in the crying of infants is to how to get through it. And part of the reason is not surprising. It turns out that the characteristics that crying has in the first three to five months of life are unique to the first three to five months of life. And they all have the capacity to frustrate caregivers. So if I can go through a few of those just to remind you, and we try to capture these in the phrase "the period of purple crying". Not because the infants turn purple, although they sometimes do when they cry a lot. But rather because the letters of the word purple each refer to one of these six properties which is frustrating and specific to the first few weeks of life, months of life.

The first P refers to the fact that in general, and most parents who have especially high-crying infants will know this, that the crying tends to increase in the first two months of life and then reaches a kind of a peak and then begins to decrease over the next two or three months of life.

Now for any particular infant they might increase quickly and decline more quickly or take a longer time to increase and decline but in general the maximum amount of crying occurs during the second week of life. Now any behavior that is in a sense negative, that increases no matter how good a caregiver you are, no matter what you do, is extraordinarily frustrating. And that's exactly the character that crying has and because of this early peak pattern crying can be terribly frustrating to mothers or any caregiver at all.

The second characteristic is that part of this crying is inconsolable crying jags, if you like, or bouts of crying that go for minutes to hours sometimes, up to two to three hours is not uncommon and some infants can cry much longer than that and still be completely normal.

But these crying jags come and go for no apparent reason and unrelated to anything in the environment. Contrary to common expectations it's not related to wet diapers, it's not related to feeding; these crying jags come and go on their own with no apparent explanation. So that can be frustrating as you can imagine.

Thirdly, they're resistant to soothing, and that's the R in the word purple. No matter what you do, drive them around the block, feed them, they'll calm down just a little bit for just a small period of time, as soon as that's over they start crying again.

The second P is for the fact that when they're crying like this they look as if they're in pain even though pain isn't part of the story. And there's no way you can tell from the facial grimness or from the sound

of their voice whether they're in pain or not but they seem to be.

The L refers to the fact that these bouts are long lasting. I've already alluded to the fact there can be three to five hours of crying per day but individual bouts can last for 35 to 45 minutes, on average and often up to two hours and more.

And finally, even though we don't know exactly when the crying's going to happen, it tends to cluster in the evening hours, which is what the E refers to. We call this a diurnal rhythm, there tends to be more of it in the evening, less of it during the day. They may cry at any time but it tends to cluster in the evening hours. And as you can imagine, that's when parents are most frustrated, most tired, when dad comes home from work and he might think that the baby's just crying because he's there but actually this diurnal pattern is well recognized and it's independent of whether dad comes home from work.

So all of these characteristics are very, very frustrating. They all make us as caregivers seem to be out of control as far as this particularly negative experience is concerned, and there's nothing that's more frustrating than things that are beyond our control. We don't like that. It doesn't sit well with our understanding of what we should be as good caregivers and to the extent that this is beyond our control that's very, very frustrating.

So this understanding that these characteristics are there, that we have inherited them as part of our evolutionary inheritance, that in some contexts they have very positive value in terms of the survival of the infant, like in the Masai infants who were going through a famine, and just remembering that, it's not our fault if they're crying, once we've done all the usual and wonderfully intuitive caregiving things
which we typically do as humans and caregivers. And we need to remember to do that. It is helpful, it is important, but some of the crying is not going to be stopped by that and that however is not our fault. And knowing that there's an end to it is probably the other most important piece of information that all
caregivers need to know. There's no way that it's not going to be frustrating. It will be frustrating but it does come to an end and it is normal and it's not their fault.

## Battle – emergent curriculum (1:29)
Communicating & learning - 3.3 Creating curriculum

Emergent curriculum is curriculum that arises from a variety of different areas. It arises from the interests that you've seen that children have been participating in, in their play. It arises from the developmental themes you see erupting or even some of the developmental needs they may have, that you see through their play. And I think most importantly it comes out of our passions and what are we passionate about and sharing that with children. Tied to emergent curriculum of course is the value of having a wonderful environment that will stimulate children, provocate some interesting things, that you have a really clear image of the child and your image of the child is one that we look at kids as being competent, capable of constructing their knowledge. And, I think the most important thing is you have a real relationship with children; different than the teacher-child relationship - something strong, something you know, something about each child and they know about you and you can base your curriculum on that.

To be equal with children, I think, is the other big foundation. You collaborate with kids in building these projects, in building your curriculum. And again it goes back to your image of the child. If you really look at them as capable you really look at them as good partners in our collaboration instead of something just sort of, just something not so deep, so surface. If you have that image of the child it becomes very deep and a real collaboration.

## Battle and Walden – risky play defined (3:40)

Coping & competence - 3.3 Valuing play

*Melinda:* Based on Ellen Sandseter's research, risky play is defined as an exhilarating or exciting form of play that may possibly result in injury.

*Marc:* And it's also, it's an exhilarating play in which they're dealing with a stimuli or something that they were afraid of before and now they've dealt with it.  That's probably my most favourite part about risk.

*Melinda:* There are six categories of play.  So the first one is 'great heights' which has a risk of falling.  You usually see children jumping off of heights or climbing, swinging, big heights those kinds of things and jumping off of swings, jumping off of high places those kind of things.

The next one is actually 'high speed' which is really fun to watch children going down hills on their toboggans and or even on their bikes.

*Marc:*  Can I just add that I love the bravado of a child on the top of a hill on his trike and we're allowing him to go as fast as he can down the hill and you say 'just go as fast as you like' and they have all that machismo and the bravado before they get going – 'I'm going to go so fast my molecules are going to move' and they start going down and then they drag their foot and they slow that thing down.  I just absolutely love that about that need for speed.  You know, it's all in the context of safety.

*Melinda:*  And the risk of that is actually a collision or something right?  So those are the risks that goes with it.  The third category is 'dangerous objects'.  So for that it's getting cut or hurt with it.  It could be a pointy stick that could be a dangerous object or using knives for the first time. Scissors in the hands of a toddler.  Scissors or anything that a child is just not used to using could be a dangerous object.

The fourth element is around 'dangerous elements' that you could either fall in to or get hurt with.  So that could be a cliff or deep water, playing around deep water or playing near a fire pit so things like that.  And it's really interesting to watch children around those objects because they do know that they're around and they are able to play around them without getting hurt but as a caregiver it's really hard to watch that and you're nervous about them falling in to it.

The next one is 'rough and tumble play'.  So with rough and tumble play that could be wrestling, it could be sword fighting, it could be rough-housing all those different things that come with it.  Well this is very interesting because children get to learn about trust with each other during these times so they get to play with each other and wrestle but they also learn their limits.  They learn self-control, when to stop, when they're not feeling comfortable.  So there's so much trust that goes in when they're playing rough and tumble play or wrestling.

*Marc:*  And then the last category is 'getting lost'.  So getting lost in the woods or feeling like you've disappeared or you're away from people.  Very much like all their favourite stories that they read as a child, so just that feeling.  And that makes sense nowadays because there's the term 'helicopter parenting' or the parents are always, always there.  So I can see this part of risk being one of the big ones that children want to experience.  How do I get that feeling where I'm away from you, I'm lost? – which is really hard to do today.

*Melinda:*  Even with infants, when they leave the room for a few seconds and they're around that corner and they can't see you, that's being lost for an infant, so it even starts at a very young age.

**Battle and Walden – risky play project (4:35)**
Coping & competence - 3.3 Valuing play

*Melinda:*  So sometimes it's really hard to introduce risk into your programs in a child care centre or even in your home. We did a project where we went in to a school age centre and we had the children go to a creek but  there was a lot of set up to go to that. We had to make sure that the parents were on board and build that relationship and trust with the parents in order for them to want the children to go to the creek and it was during the melting season so it was a little bit more riskier to go to this creek.

*Marc:* On the prairies when the snow melts the rivers get really high and they become very, very dangerous places for children. But we met with parents before we did any of this and we talked about why we felt risk and taking chance was important and we got them on board. And it was wonderful because once we started talking about risk with parents, then the parents tell their risks and how yeah. . . and it was almost like I forgot about this stuff and it was just reminding people that and also making people feel trust that we know what we're doing, we're going to do it in a safe way. We're going to do risk but we're going to do safe risk because it isn't worth it if people get hurt.

*Melinda:* So the first thing we did is the day of Marc and I went there and we assessed just to make sure that it was safe enough for the children to go there. And we thought it was good enough for them to go. When we went to the centre, we talked to the kids and just asked them like what are some of the dangers around the water. Marc told them a story.

*Marc:* I told a cautionary tale. Cautionary tales were always those tales to help kids manage the risk and so here we were taking them to a dangerous spot so I thought, I'll tell a cautionary tale about things that live in the water that would take children, right? And of course, we all had a good laugh but there was a good message about that's why we have these tales. They're to protect you when the parents aren't there when you go and play.

*Marc*: There is a natural need for children want to play in water. So we were taking them to a very dangerous water source but we made sure that they were able to splash in every puddle on the walk there and get as deep as they could and get what we have here in Manitoba is called a "booter" when your water goes in to your boot. So go get some booters, play in the water that is safe to play in, that isn't moving fast. We found a little creek just a tiny little thing so they could splash about. Once they got that out of their system, then we went down to the river, right? Now they didn't have to play in the river. They've already done that with the other bodies of water.

*Melinda:* On our way down towards the creek, I got them to assess the feeling of the grass  underneath their boots just to make sure that it wasn't slippery and they knew what their shoes and the grass felt like so that they weren't slipping on the grass into the creek. And once we got there, we had made these boats for

them to float in there and we had two little boys who made catchers to catch the boats on the way over. As the children were playing around there, they got more comfortable and you could see that they weren't as hesitant to play around there. And actually the caregivers, it was interesting because they were all really nervous before we went there with all the children and that's all about trust again. And they, once they got there and they saw the children playing and doing it safely, they all of a sudden felt that the children were able to do it. They could see the capability in the children.

*Marc*: And we documented it so we took pictures of what was happening to be able to use that as a springboard for conversation when we got back to the child care centre for the other caregivers who feel nervous about that stuff and the parents too.

*Melinda*: So when you're letting children experience these things and the caregivers get to see the children do this, you actually see a complete difference. They want children to take more risks and be able to do more things. It just gives that confidence to the caregiver as well to the child that everybody's being trusted.

*Marc*: If I can add in there, we talked about how risk changes the child's picture of himself. He sees himself differently when they take part in a chance like this. While the staff also see the children differently when they see the kids involved in this risk – "Oh, you know I've had troubles with this child all day but when we put him in this situation he rises to it and he does what he's supposed to be doing". That I think we need a lot more in our field where we're seeing our kids a little bit differently, right? So when we give them a little bit of chance they rise to it and they do it well. So it's not only good for them it's also good for the staff. And you're right, it opens everybody up and at least it opens up to a conversation, you know, a conversation about what are the risks that we're ok with and what are the ones that we're not. And that's another thing we need to have a lot more in our field about – good conflict and good discourse about this stuff.

## Battle and Walden – rough and tumble play (1:33)

Coping & competence - 2.3 Emotional learning

*Marc:* I've been in the field for a while and when I first did rough and tumble play with school-agers, mostly young school-agers there was very clear rules that boys only wrestle boys and girls that they even wrestle, they would wrestle. Now we just did a little risk project with a school-age program here in Winnipeg and they were wrestling and they were pushing each other off of this picnic table on top of snow and I noticed that there were girls up there and the boys would get up there and they'd fight them and they'd wrestle them, right. So after that one little wrestle match we sat down with them and I went up to the young boy, because this is out of my culture, you know, being a 50-year-old man. I said, "Is it appropriate to wrestle girls?" And he goes, "If they're the same size all fair is fair." You know that's absolutely beautiful because when we think about pre-school kids, developmentally, that's when they're starting to develop that stereotype around genders. And if we were in a program without risk, how would we ever learn what the possibilities of a girl is, right? – within that play, because what happens when we deny them that risk and that opportunity to take that chance, they fall in to these rigid gender roles.

*Melinda:* Another thing I've noticed too is when children are wrestling they size the other person up. I've had a child who – we're like, "Who do you want to wrestle?" and one of the ECEs said, "Oh, I'll wrestle you." And he looked at her and she's like, "No – but I'll wrestle this guy." So they know who they want to wrestle and based upon their size usually or their ability sometimes.

## Bennett – kinship care (2:07)

Coping & competence - 2.2 Family relationships

Kinship care is recognition of extended family members and their ability to care for children. So this would include grandparents, this would include aunts and uncles. And it doesn't necessarily also mean that it has to be a family connection. It could be a community connection as well, because those kids belong in that community. So we have a wide recognition of who is our kin, so community members for certain can be part of that well.

I am from the First Nation community of Sandy Bay. So our agency and our community; we are implementing a new model based on kinship care and recognizing too that many of our families who want to be caregivers for the children in our communities need financial assistance. So how do we get around that?
And so it's really recognizing the role of extended families in our community and giving more teeth to recognition of extended family than what we see in the legislation around child and family services. So even though they say they recognize an indigenous child's cultural background and extended family members, sometimes they just don't put that into real action.

So I know with Sandy Bay they are working really hard to strengthen and recognize that we do have people in our community that can provide care to our children. And sometimes to be able to do that they need financial assistance, because that's really what it's all about. People do want to look after their own children but the way the world works today, it's all based on money, so they need financial help because so many of our families live in poverty. So we have to turn that around.

## Bhutta – inequity (2:08)

Developmental Health - 1.2 Growing up in poverty

The world is beautiful when you look at it. But it's an ugly world also because, if you recall, that particular quotation from Tagore it was that "Fate has allowed humanity such a pitifully meagre coverlet that in pulling it over one part of the world, another had to be left bare". So he was just stating as a matter of fact his position that there was not enough distributive justice in the world and that many people were fated to be deprived, to be hungry and naked and homeless which is what he observed during several of his trips in Bengal in and around the time of the first of the great famines.

Now that is a very pessimistic view but it's an important view to underscore that we do face tremendous disparities and inequalities in the world today and while inequality is a reality of life, inequity isn't. So my point when I mention those data and figures to students is to underscore the fact that inequity is an unjust inequality. It's something that we can do something about. We may not be able to change the social structures of the world that there will be the rich and there will be the middle class and the poor. But when the poor are deprived of basic rights and access to food, to health, to nutrition, to security through structural mechanisms, which are unfair, then that inequality becomes an unfair inequality called inequity. Every child born in this world today has a right to his or her fifth birthday and to a similar opportunity as a child grows up to be a school age kid or young adolescent girl as anybody else anywhere else in the world.

## Black - experience and brain development (1 :45)

Brain development - 1.2 Experience-based brain development

In development sometimes we think about two kinds of experiences. There is experience expectant and experience dependent. Experience expectant are things that the organism, primarily the brain, is expecting – to be able to develop.

So an example of that is that as the auditory cortex is developing then the brain expects to be able to hear sounds and then responds to those sounds, develops in response to those sounds, expects to have sight and responds in – to those, expects to have some of the nutrients available and responds to those nutrients. And if not, then development can be challenged or can be thwarted to some extent.

Experience dependent has to do with the individual. So the easiest example is probably language, so that if a child hears French then they will start to understand French and then they will be able to form words in French that sound like baby French. If a child hears Japanese, then they will – the same thing will apply. They will learn to understand and they will learn to start make sounds that then are moulded into Japanese. So those vary by the individual, but certainly shape early development.

## Blackstock – leap or shuffle (2:10)

Developmental Health - 3.1 Advocating for early child development

There's this calling in the colonial context that First Nations should be patient with the government as they remedy these human rights violations, particularly for children. I don't agree with that. I don't agree that patience is a virtue in this situation. Children only get one childhood and particularly an early childhood. During some of their most important years in their development. They're going to affect them throughout their life course and indeed into the next generation. They can't wait five, six years, a decade, 20 years for the government to get their act together. So, when it comes to remedying inequalities for children, I think you need to do it in a leap and not in a shuffle. Not one year at a time, not one budget at a time, it's something that needs to be done right now.

In 2016, the Canadian Human Rights Tribunal found that Canada was consciously racially discriminating against little children, First Nations children. And that that racial discrimination had the effect of incentivizing their placement into child welfare care because they were denied the basic services that all other Canadian children take for granted. And what does that mean, placed in Child Welfare care look like? Well, we had a spreadsheet filed as evidence at the Canadian Human Rights Tribunal that was a federal government document. This document talked about the experience the First Nations children in child welfare care in in a way that children themselves would think of it. Which is how many sleeps until I see my mom? When we added up the number of sleeps that First Nations children on reserve, only in Canada had spent in foster care between 1989 and 2012, it was over 66 million nights or 187,000 years of childhood. That's the price of waiting and being patient with first steps by the government.

## Blackstock – supporting equity (1:28)

Developmental Health - 3.1 Advocating for early child development

There's a lot of caring Canadians out there who when they finally find out about these inequalities, they're shocked and horrified that they never knew before. But they're still worried about what if I do something wrong? How do I fix this? Maybe I should just stand back. I don't want to do more harm.

But that's what we and the Caring Society have tried to remedy with our 'Seven
Free Ways to Make a Difference' in under two minutes. So, we already have ways that are approved by First Nations in Canada on how you can get involved.

If you're an early childhood educator, you can sign up for those campaigns for equity in education, child welfare, the Spirit Bear plan, all kinds of things. We really try to make it easy for people of good conscience who want to join with us in a community of rectifying the colonialism both past and present.

So as early childhood educators, whether you have a First Nations child in your classroom or not, you have a duty, in fact, an obligation to join the chorus and say that First Nations children are worth the money. And the time for racial discrimination and inequality is over in this country. No child, either a First Nations child enduring that inequality or non-Indigenous children growing up in a society where that's normalized. No one should tolerate that.

## Brownell – language arts results (3:47)

Developmental health - 2.2 The gradient effect

I mean that was when we first began working with the education data and what we were particularly interested in, up to that point the Department of Education had used these data, and basically what was there were grade 12 standards tests. So this is a test that all grade 12 students take in language arts and mathematics. I'll use the language arts as an example. It's worth 30% of the students' marks, and they need language arts, they need that course to graduate from high school. So it's a pretty good indicator of, you know, where this kid's go after or is this kid going to graduate from high school.

So we thought, 'well let's look at them and rather than doing a school by school comparison, let's group people into socioeconomic status and see if we see what's known as the gradient, the social gradient. And basically that says it's not just that the poor do more poorly than the rich, but that with every increase in socioeconomic status you see this increase in performance.

So that's the first thing we did. We looked at these education data we got from the Department of Education and ran this analysis and sure enough, we found our very lowest socioeconomic status group-we split into five groups, about 76% of them passed the test—and with every increase in socioeconomic status you saw this increase in performance so that 96% of kids from the highest socioeconomic status neighbourhoods were passing the test. And we thought, okay, if the gradient is there, not nearly as steep as we were expecting.

And so, you know, we kind of looked at it for a while and we said, 'You know, I don't think we're getting the whole picture here. What about the kids who never made it to grade 12? What about the kids who are struggling to make it to grade 12? They're not represented in what the schools are seeing and what we're seeing here.' So by using our link data, we were able to look back and say, 'Let's take a cohort of kids, born in Manitoba, who lived in Manitoba all through' and in the year that we were doing the, the test was given, these kids should have been writing if they had progressed through the school system on time. So that, you know, they all start kindergarten the year that they turn five and they all start grade one the year they turn six and if they progress through the school system they should be in grade 12 writing this standards test in the year we looked at.

And because of this population-based registry we were able to look, link to, we knew the kids who had moved out of the province, so obviously we didn't want to look at them. So we knew these kids were still living in the province, that they didn't show up in the test, we could find them somewhere in the province. So that's what we did. And when we did that, when we took that look with the entire population that should have been writing that test, it was a massively different story. Now, only 11% of the kids in the lowest SES compared to 76% of the that we saw in our first analysis—only 11% are passing that test on time, compared to, I think it's about 85% for the highest SES.

So the gradient is, it just becomes so much steeper when you add in that other information and basically what's driving the difference, was the kids who had been held back at least a year or more so they were either in grade 11 or lower, and we know that kids who are held back somewhere along the way in their school career are less likely to complete high school. And then about a quarter of the kids from the lowest SES families had dropped out of school all together. Compared to, I think it was about three percent in the highest SES. And that too showed a gradient. With each increase in socioeconomic status, you got a decrease in the kids who had dropped out.

So it provided us with a much truer picture, we felt, of socioeconomic status. And it really, I mean, knocked our socks off. It knocked the socks off the Department of Education. And it really, you know, it sort of went all over the nation. People kind of going "Wow. We knew there was a gradient but we had no extent, no idea of the extent of this gradient."

**Brownell – program example (1:45)**
Ecology of childhood - 2.3 Early intervention

There's lots of education research out there that says that one of the reasons that low SES kids do more poorly is-- they do pretty well throughout the school year and then the go on holiday and all that learning, well not all that learning, but they sort of slide backwards whereas the kids from higher SES families, they're going on interesting vacations, they're interacting with their parents a lot. So their learning stays level or goes up a bit. So when they come back to school, there's an even bigger gap.

And so to try and reduce some of that summer learning loss, this program operates in low income areas and they provide enriching experiences for these low-income kids. So that's one program that came from, you know, I guess the impetus was, you know, "Look at all these high school students. We're losing them".

You can have the best program in the world, doesn't mean that those who really need it will come to it. And I think they found the same in Quebec when they offered the universal child care—I think it's $7.00 a day. What happened was the high income families were really mobilized to go, and they found out where the best day cares were, how to get their kids into them, and the families that are experiencing challenges, the ones who really need the good day cares, just don't have the resources to be able to go out and do that and get their kids into the best child care.

So, you know, it's one thing to have the programs, it's another thing to make sure you're reaching all those hard to reach and challenged families. So I think that's one big challenge. But the other thing is, you know, we definitely need more resources put into those early years. I mean, we should have a very comprehensive early childhood program—including child care—but including other things besides child care.

## Brownell & Butler-Jones – Social Determinants (2:42)

Developmental health - 1.1 Life course trajectories

Certainly we know that once you're sick you want the health care system, right? You want to be able to see a doctor, or you want the facilities of a hospital if there's something that a hospital can do for you. But, there's the recognition that there's a lot more out there that determines our health than health care. Things like socioeconomic status. And within socioeconomic status we have education level, whether or not the parents—if we're talking about kids here—the parents are employed, what kind of income they have. These are the social factors within a child's life that are going to have an impact on their health: now and in the future.

It's everything from education to income to employment to the environment to a whole range of factors that we know influence the choices. So in an old health promotion concept, it is about making healthier choices easier choices, and we know that the choices are limited often by your involvement, being marginalized, not having the skills in terms of parenting etc, so there's a whole range of factors that can influence how a child develops, what resources they then have as they go through the school system or as they grow, and ultimately their success as adults is so often determined in those early years.

At the end of the day when you look at all of the factors it's really quite striking. Once you've got, when you look internationally, once you got the basics in place: you've got a roof over your head, food in your belly, you're not drinking contaminated water, you've got the clothes on your back, you're employed or involved in the community in some way; that you feel part of that community, once you've got those basics in place, clearly all of those make a tremendous difference.

And so, once you've got the basics in place though the two things that seem to make the biggest difference is our ability and sense that the decisions we make we actually have an influence over our future; that our decisions are not taken away from us; that what we do actually does matter, and therefore we're more likely to make good decisions.

And secondly that we have people that care about us and that we care about.

People who are engaged, people who have relationships, if you look at the difference between those who are most isolated versus those who are well connected, the most isolated die at twice the rate at any age, male or female, than those who are well connected. And we know in terms of that ability to make decisions, when you take decisions away from people, when you basically institutionalize them whether it's in the reserve system, whether it's in terms of institutions for the aged, whatever it is, if we take away their decisions then there's less sense of purpose.

**Brussoni – research on children's play (1:42)**
Coping & competence - 2.4 Play, coping and competence

There's been a lot of great research on how children play on those kind of prefabricated structures. There's a landscape architect from the UK called Helen Woolley who has labelled them KFC structures, for kit, fence and carpet. So the carpet being the surfacing, the kit being the structure itself and then there's usually a fence around them. And she's done quite a bit of work, as have others, around the play value that those have, how children play on them and so on and comparing those, for example, with play structures or sorry, play spaces where there's more, say, loose parts or natural materials or those sorts of things.

And it's very clear that the play areas where there's more variety of play, affordances for play, different things that kids can do, are of superior quality and better for the children, developmentally, health, wellbeing-wise, than the ones that rely on fixed equipment that can only be used in a specific way. So, it doesn't really allow the child to stamp their own imagination on that.

Plus with; over time, those structures have been getting - the challenge has been taken more and more out of them, so the height has dropped and we've seen a lot of what used to be interesting, taken away, and so kids often don't find them interesting anymore so they can disengage whereas they get much more engaged if they have loose parts or other materials that they can play with, that they can really think about how they want to use that and just do whatever they want with it.

24

## Butler-Jones – child health problems (1:16)

Developmental health - 2.1 Social determinants of health

One is mental health. I mean that nurturing environment for kids, that support for kids as they're growing; I remember working with a very wise psychiatrist many years ago when I was a young resident and him talking about the method of parenting matters less, actually matters very little at the end of the day other than the fact that the kids that are truly loved and know it, they may go through rough patches, but they tend to turn out okay.

And quite honestly that's been my observation as well. That those nurturing environments where kids are supported, stimulated, allowed to be kids as they grow, and to learn as they grow and to be supported in that learning I think is critical, and it's very inconsistent unfortunately.

The second piece is a physical one linked with mental health but more physical and with long term consequences, and that's the rising rates of obesity in children.

Unfortunately if the trends continue, this may well be the first generation of kids not to live as long or as healthy as their parents. That's a tragedy, and it's something that's creeped up on us. It's something that we've actually been responsible for, partly by not paying attention.

**Butler-Jones – community decision making (3:48)**
Ecology of childhood - 3.3 Creating child-friendly communities

And we haven't, as a society we haven't always offered the same opportunities to everybody and that's where some of the things, as well meaning as they might have been for some, things like residential school where kids were taken away from their families, put into a school, it did afford an opportunity for some education but it, again, in some situations there it was abusive, but it was also denying of culture, denying of experience, and many of those kids because they didn't have the opportunity to be parented have a greater challenge in parenting their own kids, and how do you break that cycle? Well you do need supports, advice, etcetera moving forward and as the kids grow, too, opportunities to actually see that the decisions they make have an influence, they do have a choice.

What we find is those reserves that actually have greater control compared to those who have very little control - their suicide rates in adolescents are virtually zero; much less than the general population. Again that ability, that what we do makes a difference. The choices we make a difference, and then you invest as communities and individuals and that, and then local leadership that supports that. I mean it's all really critical, and we sort of take it for granted and we worry about the mistakes etcetera, but the reality is when you look at the development of Canada, you look at the development of municipalities, you look at al these things, that it's not an even course for any community no matter what your origins, but you have to have the ability to make those choices and you need some supports in doing it, and evidence to support that and a conversation that allows us to learn from each other moving forward.

That's why one of the reasons we do the annual report on the state of public health as to engender some conversations, hopefully some different ways of looking at things that are beneficial as we go through our training or weather as municipalities, or as band councils in terms of what are the kinds of things that will actually help our community, and it's amazing, it's an old Samuel Johnson quote from hundreds of years ago, but it's amazing what you accomplish when no one has to get the credit. In other words, when the focus is on the community, or the program, or the activity, and it's not just about that individual thing it's in the context of that society that we're working with and having respect for that and listening to that and it's not about the experts coming in and telling people what to do, it's about us collectively journeying together from where we are to where we would hope to be.

And communities have a lot of wisdom in that, even dysfunctional communities have some wisdom in that, so how can we support them to get where they would like to go, nor presuming where that is. That's a big challenge for public health and for public services more generally. But we've learned a lot about how important that is, and listening to the community is probably the first step.

When we as a community or a society figure out what works we actually do very well, but then when we do well we kind of forget what got us there and we take things for granted and we break down some of those structures or

institutions, so it's really a caution to be willing to actually step back and not presume and learn from the past and apply that as we move forward, but it does require conversation. It's not about anyone's vision, it's amazing when you get people together that by in large, you know, the collective wisdom actually usually is pretty good if the motives are there that what can we do better together as opposed to just what's in it for me.

27

## Butler-Jones – pre conception health (1:56)

Brain development - 3.1 Advancing maternal and prenatal health

I'd actually take it back to pre-conception health, not just pre-natal, cause usually we don't find out we're pregnant, for a woman, not me personally, but we don't out we're pregnant until sometime through, and looking after ourselves generally is a good thing, not just for ourselves but for our babies, and for boys in terms of the health of their part of the contribution, the sperm etcetera, again looking after yourself; eating well, being active, not, you know taking things in moderation. I mean, one of the things I often talk about is everything in moderation, including moderation. In other words don't beat yourself up, over, you know you had two glasses of wine rather than one or whatever; don't always go there, right.

And binge drinking etcetera is damaging to the individual, but particularly if you're pregnant and you may not know it, but also in terms of influence on the male side of it. So it really is about looking after yourself, and then being even more careful during pregnancy in terms of avoiding unnecessary medications, though if you need it, you know the mother is better off if, cause again, stress of the baby etcetera, so it's always about trade-offs, but that's why we have doctors and nurses who can provide advice. But the first presumption is you know the least to accomplish the most with the fewest side effects, and at any stage in pregnancy, there's no substitute for basically as a parent looking after ourselves, and then afterwards looking after ourselves, right.

And smoking's a bad thing no matter when you are, but it's particularly hard on the fetus and developing lungs in young children.

## Butler-Jones – program example (2:06)

Ecology of childhood - 2.1 Families

In welfare, if you make above a certain income, you lose your benefits. One of the best things we did is Saskatchewan, well not me personally, but what the government of Saskatchewan did in the 90's was for health was to provide dental and pharmacy benefits to low income families so you could come off welfare and not lost these benefits for your kids. The result being all kinds of people now working and when you actually study it you find that they're happier, they're healthier, they're not engaged. It's not surprise they're now engaged.

Most people would prefer to work but to make a rational decision, would you actually, you know, as much as you want to work, you go to work, you don't make much more money, but you lose these benefits and these risks you increase for your kids. So if you remove that rational decision, then you find more people are actually in the workplace, then you see all the mental health, physical health, and other benefits as a result of that.

It's striking how simple these things are at one level and yet how complex they are because at this point, no other jurisdiction in Canada has implemented that in the same way in spite of the evidence.

Another example, from Saskatchewan actually, is related to connectivity in terms of if you're on social assistance you have a phone, but if somebody runs up a long distance bill that you can't pay you lose your phone, but you can put a long distance cap on, but at the time it was a $200 deposit. Well what was negotiated was for those on social assistance you remove the $200 deposit which they don't have so they can have basically free local calls and people can call in, but you don't have the risk of someone calling Hong King, running up the bill that you can't pay.

So then what happened is thousands of phones; thousands of households with phones that didn't have them previously. Just imagine the, you know not just in terms of the individual and their sense of connectivity to others but also even for caregivers, for social workers, and teachers and others to actually connect with the family. Simple thing, not a costly thing, but again, not something that's being universally adapted.

## Butler-Jones – public health report (1:30)

Developmental health - 2.1 Social determinants of health

I'm required to report to parliament each year on the state of public health and we did from the beginning take a focus on so what are the factors that influence health? So not just statistics about different rates of disease or health or ill health, but more also looking at what are those fundamental issues that affect health, what we call the determinants of health, but not simply another litany of what the challenges are but also to actually talk about examples of where either as individuals or communities or governments either through programs or practice or policies, whatever it is, that we can actually influence.

So it's not a compendium of all of that, but it is examples that can help to spark a conversation about well what could we do? Oh, that actually looks doable. Maybe there's some of the things we're already doing now we could modify in a way to better address those factors.

We've not done as good a job, I mean we seem to always do a much better job with the diagnosis than we do with the therapy or the approach and part of the role of the reports is to identify that a) these aren't new concepts and b) these aren't new ideas for which there's nothing you can do. There are things we can do if you actually step back and think about it. And if you break down some of the traditional silos between different sectors etcetera different levels of government and you have a different kind of conversation, you actually can do these things.

## Butler-Jones – relationships (1:34)

Ecology of childhood - 3.2 Strengthening early child development programs

Well, I mean we do need to pay attention to the evidence about what works and what doesn't work, but at the same time every relationship is an experiment, and the key element is respect. You cannot influence who or what you don't respect. And if you don't believe that these kids have inherent worth, that they have something to offer, then you're going to miss the opportunity to even provide influence to them, other than maybe a negative influence.

So if there's one thing that I've observed, and I think the evidence would support, is that relationships do matter, and respect in relationships do matter, and if you have that, then you can make mistakes, but you can get over those mistakes and they don't have to build on each other.

And do pay attention to the evidence because sometimes we get stuck on ways of practice that the evidence would say don't make sense, but we're loathed to give them up. And that's not to diminish the fact that everybody is different, right, but don't ignore the evidence, don't ignore that. But at the end of the day it's a relationship, right. Even if it's with thirty kids in a classroom, it's a relationship. Those kids will look up to you, I mean the nice thing about working with kids is that their first presumption is by in large positive, and we want to continue that.

## Butler-Jones – setting healthy trajectories (3:16)

Developmental health - 1.1 Life course trajectories

Well basically at every point there are different paths that we can take and choices that either we make or things that happen to us that can set us in one direction or another, and that starts right from before birth. If my mom drink alcohol during pregnancy to the point where I have Fetal Alcohol Syndrome, I will have tremendous challenges in terms of attention deficit, in terms of decision making etcetera throughout my life. So the only way to address that, I mean we can help to steer back on a positive course with a lot of structure and supports and other things, but if we can prevent the Fetal Alcohol Syndrome, then already you're in a better position.

Same for early stages when the brain is forming, when different body parts are developing etcetera, not being exposed to tobacco smoke, having adequate nutrition in the micronutrients that we need, having a stimulating environment so that our vision is developing, so you know, just even the fact of having visuals like mobiles in the crib and people talking to you and engaging you and you're moving and working, all of that sets you on one course. Whereas if you just leave a baby in a crib and ignore them, and if you give them apple juice or pop or whatever in a bottle before they go to bed, their teeth rot out, they can't get as good nutrition, I mean it's, again, they're all small decisions in a way but when they add up, and then at each point it's understanding that if we've got off course how we can correct course.

Some things we can treat, but not everything we can treat. Some things we can mitigate or reduce the impact, but not everything, so that way thinking back to those root causes; the root problems, and trying to improve that trajectory from the beginning is absolutely critical, and it's not that as parents we need to beat ourselves up because we all do, you know, it's a learning experience. You're first kid is different than your second and your third, but if you do the best you can the reassuring thing is that by in large kids are pretty resilient, but if you throw everything at them, they're going to struggle. But, you know, one day you yelled a little too loud, you know, they'll get over it, especially if they're in a loving caring environment.

It's really about finding a balance, and we actually grow with our kids. Kids are not the future, they're today. They're the present . They're an important part of our society. They're an important part of our learning and our growing ourselves as we see kids, as kids ask us questions, and we explore ideas. Things we never would have thought about other than hearing that question even. Plus the way in which they enrich our lives. So they're not just the future, they are the present, and I think that's one of the big challenges often in policy and education, it's often as if they're these empty vessels we're going to fill up and create them. No, they are part of the dynamic society of today and we need to respect them for that, and they actually, my observation is they often know a lot more than we give them credit for, and are much wiser, much wiser than we give them credit for.

## Clinton - bullying (2:19)

Coping & competence - 3.2 Getting along with others

One of the signs that we have that things are not going as well as we need them to go for our children is the amount of bullying that we're seeing in society. And unfortunately we're seeing it in children as young as four and five where there are racial slurs, where little ones are excluded from playing; we don't want you to play with us, you're not coming to my party, so relational aggression as well as physical aggression.

But when we're talking about bullying, we're talking about the possibility of children of four and five and six years of age to be using a power differential, it happens that early, hierarchies in the social network start very, very, very, very young. Where do we see the bullying happening most and that's in the absence of an adult culture that says everybody gets to play.  When you don't have an adult culture that says at the heart we are a civic community whether in a group of five or a group of 55.

So bullying in the context of say child care is very much, in my experience, a reflection of what are the adults up to? What are they attending to?  And if they're attending to following curricular expectations instead of attending to the social and emotional development of all the children, then you're going to get different outcomes. If it's alright, they think it's just a rite of passage that kids have these racial slurs or these exclusionary and you know, that's what kids do, then they're going to allow it and it multiplies.  So it has to be addressed really as a group of adults and have dialogue, dialogue, dialogue with the kids about it.  As well, lots of great books that kids can then have conversations about, about bullying and what it feels like.

## Clinton – developing coping and competence (2:28)

Coping & competence - 3.2 Getting along with others

Those of us in the world of child development are trying to think of ways; for younger and younger, how to help kids cope and have the innate competencies or have the competencies built to be able to deal with challenge.  And we know - surprise - that the building blocks of being able to cope with challenge is having a predictable "other" there to help you get through the difficult time.   And the difficult time may be that Jamie over there took my blocks and I want them now.  How does a toddler learn how to go from, he took it now, whack! to "Jamie, I really wanted to play with that.  Can we take turns?"  How that building; and that's coping, that's coping – how that develops is through the modelling that happens with high quality childcare, that happens with high quality parenting where instead of saying "don't be like that!" you say "oh, you're really frustrated with that. We're going to use your words". Because when you use your words, this is what you say to the toddler, but we now know from the work of Adele Diamond that when you use your words, when you're actually labelling your feelings, then you are making more connections to your thinking brain.

So helping little ones cope is helping them use their language, labelling their feeling, giving them a language for it, acknowledging their feeling. So if we think of healthy mental development, we think of little ones learning how to experience, manage and express their emotions.  And how they do that is one;  being allowed to have them, two; having a nurturing adult who set the limits but give them the words and the understanding this is tough and model what it is that would be helpful for them.  That's how you develop competency in the social and emotional realm.

## Clinton – image of the child (2:38)

Communicating & learning - 3.1 Guiding and teaching

One of the key concepts that I think is important for us as parents and as educators to have is what is our view of the child?  Do we see the child as an empty vessel that we kind of have to mold in to being a good person?  Or do we see the child as a co-creator, curious, excited about learning?  Because depending on how we view the child, we will interact in different ways.

So take praise for example.  If we think that we have to reward the child for everything good, so that's a model of the child, that we have to mold them by liking to get praise then they are going to be looking to see, well, should I do this?  Is anybody around to see me doing this?  So they may have more of an extrinsic reason, an outside reason for their behaviour.

Whereas, when we see the child is competent, capable, generous by their own nature, then we won't praise them, we will encourage their efforts.  You know, wow, when you did that I can see that Jean really liked that.  Rather than oh, good job, you're so generous.

There's a wonderful researcher called Carol Dweck who talks about mindset.  And the reason I'm careful about praise, is her research shows that when you do praise children for being smart, for example, they work less hard.  They become fearful of not doing well.  But when you encourage them for their effort, "You worked hard at that" then they have what's called a growth mindset. And this we see in three-year-olds, "I'm not going to try that anymore.  It didn't work last time. I didn't a high-five.  I didn't get a sticker."  Whereas, what we want to see is the growth mindset of, "Oh, this puzzle is hard.  Give me another one.  Can you come and help me here.  I think if we work together we can get this done." And it's our attitude towards the child that determines which one of those we fit in.  Do we want to mold them or do we want to create the garden for them to flourish?

## Clinton – love builds brains (2:54)

Brain development - 1 Early brain development

So I'm an infant, child and adolescent psychiatrist and I've spent a lot of my time trying to understand how I can support parents and caregivers, early childhood educators and teachers, how I can support them in their role in helping children to be the best they can be.  And we've got, we've had an explosion of knowledge about how the brain grows and people, you know, talking about oh, you need enriched environments and stimulating and I think that that's made people a bit fearful about oh, I might kind of wreck it, not do it quite right. So I really wanted to come with a normalizing message of love is what children need.  What they need is the back and forth, the serve and return of everyday activities. It's to build children's language; it's not about flash cards.  It's about lovingly interacting with them, talk to them, take turns with them, read to them.

So that loving approach to brain building I felt was really very important to bring to parents because fear interferes with learning and we really want parents to be able to enjoy these years, not be afraid, "oh, I'm not doing enough of the right thing".

Well, when I talk about how the brain moves from weighing about a pound at birth to weighing three pounds in the first couple of years and the experiences, all of the things I talk about;  talking and soothing ; that it's those experiences through the senses that literally builds the brain.

At first parents are a bit fearful, you know, if their children are over three or six they go oh, I didn't do that, I didn't do that. But then with more dialogue, recognizing that the experiences that the majority of children have are ones that are really good enough, that the loving nature of interactions, that it's more important to put down your cell phone and interact with your baby.  That it's more important to have the buggy, the baby facing you because the baby is a little scientist. Their brains are formed by the loving interactions so they're watching your face. They're watching what you do.  They're watching to see is mommy or daddy are they making a strange face?  If they are I'll hold back. So introducing the baby as a scientist, as a little marvel, parents love it, they absolutely, absolutely love it.

## Clinton – parenting styles and brain development (2:42)

Coping & competence - 2.2 Family relationships

One of the beauties of the science of early childhood is really offering people a solid knowledge base of how the brain works, what are effective practices.  So what we know from the science is that the most effective parents are not the jellyfish parent who says "oh, don't do that, don't do that, don't do that – oh, ok go ahead and do it."  "Don't put the cat in the microwave, ok honey, ok?"  So there's lots and lots of love but there isn't a whole lot of structure.  The other kind of family that's worrisome and that's because of longitudinal data that shows that families who are predominantly 'brick wall' "Do it now because I said so."  "You just wait until your dad comes home." Those brick wall, cold, coercive parents we know that doesn't work well in the long-term.  That the best outcomes for kids are the backbone parents who are more authoritative.  So they're more democratic. They have lots of love but very, very clear expectations and high expectations.

So what's the difference in the brain of children who experience that kind of parenting.   And for me that's linked in to the stress system that when you have a parent who is brick wall, punish it, punish you, do it this way – what that generates in the brain is mistrust. What that generates in the brain is anger. What it does is it makes your limbic system, your emotional system be the one that's taking the most charge.  Whereas, when you're authoritative, when you're a backbone, then you are connecting with the child first of all, you really want to go to that dance, but you know our family don't really approve of eight-year-olds dressing like that and going to that kind of a thing.  It really makes you angry, I know, I know.  So what that is doing is connecting to the thinking part of the brain, making the connection and building the pathways between the limbic, emotional part of the brain but the thinking planning, organizing part of the brain.  So that being connected makes all the difference in the world.

## Clinton – self-control versus self-regulation (1:06)

Coping & competence - 1.1 Self-regulation

The difference between self-regulation and self-control; self-control, if I'm sitting here and I'm worried about what's the next question going to be or as we walked along the hall, coming to the studio, there was a disturbance. I can be sitting here very well-controlled, self-controlled, but my mind is spinning all over the place, not able to focus as much on you. I'm really paying attention out there. Biologically, inside my heart racing and my guts churning, so I appear regulated but biologically, emotionally, behaviourly I'm still. But I am not calm, alert to learning if I've got something else going on. So the self-control is what I appear. Self-regulation is much, much more complex.

## Corter – contributing to self-regulation (1:03)

Coping & competence - 1.1 Self-regulation

We know in young children for example that what happens in utero can contribute to it. Stress, nutrition, and of course parenting is crucial. Once children emerge into the world and how parents are sensitive to infants' cues, how they provide appropriate challenges for young children. How they talk to their toddlers about the world can equip the child for this lifelong development of self-regulatory ability. And we know from some of the long term research that these abilities in early childhood actually predict adult success in terms of economic success, social adaptation, relationships, avoiding crime and so on. So we know self-control, self-regulation in early childhood is building towards adulthood.

## Corter – influencing self-regulation (1:03)

Coping & competence - 3.3 Valuing play

For example playing a game with the child and modeling an appropriate self-regulated role in that game for children so that's something that early childhood educators can do.

And there are other forms of programming that can build self-regulation. It's not as if self-regulation happens on in play. For example research on older school age children shows that martial arts training can be a contributor to the ability to manage and control one's behaviour and emotions and energy. So, it's not the only form of influence on self-regulation, but it's a very powerful one that children can do together quite naturally if we manage it properly.

## Corter – monitoring play (1:53)

Coping & competence - 3.3 Valuing play

If you ask children what they like about early childhood programs, they rate play as the thing they like the most, but if you ask them what don't you like about your program, they also mention play gone bad. For example, when other children don't let you join in play, that sort of thing. So not all play works perfectly and professionals, early childhood educators need to monitor the play of children. They need to support it in ways where it is productive in the development of children's self-management, self-regulation, and even for pre academic skills and literacy, math, and science, and we know from research that it can, if properly structured, lead to self-regulation, but we're not quite sure about all the elements of play which do that, but we do know that play needs to be structured so that children stay in dramatic roles if that's what they're doing, so they extend them so educators can monitor and step in and help do that, but we're not just talking about free play, we're talking about intentional monitored play where educators are thinking about the skills that children may be developing.

And play is particularly important in terms of monitoring the play of individual children because all children are different. Not all of them will go to the center where dramatic play is happening, so how do you move children around programs so that they're getting the experiences, the play based experiences, that will help them develop as individuals.

## Corter – Parent outreach (1:00)

Ecology of childhood - 3.1 Sustaining home life

The last thing that I think we have to do in being successful in parent engagement is emphasize outreach. Because, when we talk about parent engagement, maybe it's the ten percent who come in for the meetings, or the fifty percent, or even the eighty percent, but what about the ten percent who aren't coming? That may be okay if they're engaged at home, but what if they're depressed parents? What it they're living under circumstances where they feel marginalized? Try to reach out to respect and communicate with each parent I think would be the message that we've learned from our research is critically important, because if we don't do that, if you engage the already engaged parents even better, you're going to be widening gaps between the haves and the have-nots.

## Corter – resource parents (0:22)

Ecology of childhood - 3.1 Sustaining home life

Communicate to parents that that is important. Some parents will want help and parent education in terms of how to do that, so I think schools and childcare centres should be prepared to help parents find those supports in the community, or even offer them on site if that's possible.

## Corter – respect parents (2:45)
Ecology of childhood  - 3.1 Sustaining home life

Parents also play a critical role in everything, naturally, and so their role in interacting with infants, with toddlers, and preschoolers, is going to be very important to building these kinds of skills as well.

The question about how to engage parents in early childhood programs and in primary schools is a burning question. If you look at the practice and policy literature, you'll see there's the constant question of how do we bring parents into our programs, whether they're childcare, whether they're school programs, and I think there's been some misunderstanding in terms of there being sort of one way to do that or a set of ways that are going to fit all parents. I think all parents are different. Different groups of parents look different from each other, but within different groups of parents there's so much variability in their attitudes, what they're looking for, but every parent wants what's best for her or his child. So we can start with that and we think that professionals want that too as a common starting ground. But I think to truly engage parents, you have to recognize and respect the importance of what they're doing, and it may not be the visible forms of parent engagement where the parent comes to the childcare and chat up the early childhood educator as she drops off her child or as he picks up his child, or the parent who comes to school and volunteers or serves on school council. Those are visible forms and that's what we've always said well we've got to get more parents out to those school council, PTA type meetings, but in fact the most powerful things that parents are doing are probably at home, or are at home, and even with respect with what's going on in the childcare or what's going on in the school, the parents help prepare the child to be successful in that.

There's so much parents are contributing. So I think one way to engage parents is to acknowledge that, and let parents know that's critically important to that partnership that should be formed between the program and the home. So that would be the number one principle: respect parenting.

## Corter – self regulation (1:33)

Coping & competence - 1.1 Self-regulation

Starting with self-regulation, we're discovering more and more about how it develops right from the period of pregnancy all the way into adulthood, and how early experience help shape self-regulatory capacities throughout the lifespan. So self-regulation means a number of different things in the literature. People talk about self-regulated learners when we're looking at school age children but we know it's something that begins well before that. So it's actually learning to manage yourself along a number of dimensions including emotional, behavioural, cognitive and learning, and social interactions, so it's really a whole collection of self-management skills. Their core cognitive abilities around being able to focus attention and shift attention. Having working memory that allows you to keep things in mind and being able to inhibit both your thoughts and your actions appropriately. But we sometimes think about it as being a self-control that means dampening down. However it also includes the ability to activate and mobilize energy to do things that you need to do. So it's a very important set of skills that have a lifelong course.

## Corter – parents supports (3:46)

Ecology of childhood - 3.1 Sustaining home life

I think the research suggests that anything we can do to support parents is going to be paid back in terms of how it supports children's development because families have the biggest influence on children. Childhood services are important, early childhood programs are essential, but families come first in terms of the influence that they have on a child's development. So we believe that, and the research supports this, in believing that parents need to be supported in many different ways. And we recently wrote a literature review for Invest in Children as part of their Community Vitality Project on the question of what kinds of supports do parents need and want. And we really came to the conclusion that parents need tangible supports, but they also need intangible supports. And it's easier sometimes for us to think about the tangible supports. Ideally parents would live in healthy communities where they have jobs and there would be services that keep the community safe and healthy, and there would be amenities such as libraries and community spaces where children could play, and services for children and parents. So that would be part of a tangible support that would make parenting easier, that would help parents do the best job they can for their children, and it would help children develop in the healthiest possible way.

But in looking at the literature and in talking to parents in our own research, we find that intangible supports are sometimes overlooked. That is, we think about rolling out the hardware, but we don't think about what parents need: the relationships that they need to sustain their work as parents. We always emphasize the importance of the parent-child relationship and the attachment relationship but parents need relationships too: to support them to be able to make that attachment connection. So, one example of an important relationship is the relationship between parents and professionals. Whether that professional is a child care worker, or a kindergarten teacher. And we find if that that relationship is respectful, mutually respectful, then that helps the parent achieve the feelings of empowerment and capacity to make a difference in the child's life; to be empowered to connect to services, find the resources that the parent and the child needs.

And that relationship between professionals and parents can fuel that kind of capacity for parental competence and to empowerment. So we think that's an example if an intangible support. So it's not just about the service. It's partly about the relationships that go into that service and into the connection between the child, the parent, and the professional. So we need to have a three-legged stool of professional, parent and child. Not just a two-legged stool of professional and child, or child and parent. If we get that multiple support, we're more likely to have an impact on child development; we begin to pull together the ecology of the child's development.

## Corter – valuing parents (1:59)

Ecology of childhood - 3.1 Sustaining home life

Another example of an intangible desire that parents have is they want to feel supported by society for what they do. They feel under-valued for what they're doing. Parents of new infants feel isolated. They often don't have other parents to talk to about their daily existence as parents in the first year of life. There's no place to come together to feel a sense of community and to get recognition for the important, hard work that they're doing. And parents feel that the public, society in general, doesn't really recognize the value of what they're doing. And maybe that goes back to our society's idea that parenting is really something you do in private. That it's really the family's job to do parenting, and then churn the child out into the public system of school or whatever.

But I think that view is faulty because in every country around the world, children are in services outside the home, they're out in the community beyond the family even before they go to school. And we need to make sure that period is an optimal one: for parents as well as for children.  Another important intangible is that parents want to have a voice in to how society's designed to help support their children. So they don't just want to find what's available in the community. They want to have a say in how services are arranged, and how they're delivered. And I think we're more and more recognizing the need to involve parents and listen to their voices in early childhood services. Not just in parenting programs but in child care, in kindergarten, in schools. And that's an important recognition.

## Durrant – celebrating independence (4:37)

Coping & competence - 1 Coping and competence in early childhood

Yes, when children begin to talk, we celebrate, when they begin to walk, we celebrate, when they do these things that signal their independence really, we celebrate and yet there are some aspects of their independence that we don't celebrate, in fact we try to stamp out. And those are things like saying 'no', or deciding what they want to eat, or deciding what they want to wear. And those are actually, although they can be irritating for a parent who needs to get out the door, who's concerned about the child's nutrition, who wants the child to look perfect because they're going to get their pictures taken today, the parent can feel frustrated because it's not going their way. Those are also actually signs of independence that should be celebrated.

And I think sometimes parents get irritated not because they're thinking about the child, but because they're thinking about what the implication is going to be for them. This is quite common, and as a parent myself, I can relate to this feeling that if your child isn't behaving as all children you think should behave in a public place, you feel the pressure of the public eye instead of thinking about 'what is this behaviour mean from the child's point of view'; 'what are they trying to communicate to me' and 'what does this signal in terms of their development'. So when children, for example, first start to say 'no', parents might interpret that as defiance, say. They don't, if they're interpreting it as defiance or a threat to their authority, they're not recognizing this very important developmental progress that this child is making in their ability to say 'no, I can make my own decision'.

And if we think ahead to our long term goals and what we really want our children to be able to do in terms of their competence when they're older and we're not around anymore to guide them, we want them to be able to stand up for themselves, we want them to be able to state their opinions, we want them to not do what everyone tells them to do, we want them to be able to have their own voice. And that begins with the word 'no'.
Now there are of course behaviours like running in to the street, or poking fingers into electrical outlets, or doing dangerous things that we can't let children do but we need to guide them around those safety issues in a respectful way that doesn't squelch their sense of competence, and their sense of independence, and their ability to feel that they can say what they think. We need to nurture that while keeping them safe. And of course one of the best ways to do that is to child proof our homes so that those kinds of episodes simply don't occur. If the child has a safe environment then she can explore, and she can set her own agenda to a large extent.

Certainly there are situations where parents have to get out the door on time. There are just practical, everyday kinds of incidents that arise many times in every family's day and I think it's the way that we respond to those that matters. Certainly, the parent has to get to work on time and they can't just sit and wait all day so the child needs to also learn that there are certain expectations that have to be met, but that can be done in a way that respects the child's developmental level; that respects the child as a person, as an individual, and still meets the parent's needs. Hitting and yelling and punishments are not going to help the situation. They tend to make the child even more resistant.

Just like adults, when barriers are put up all around us, we tend to want to break through them. So parents need to build their skills in eliciting children's cooperation, not coercing them to comply. Those are two very different things; different processes.

## Durrant – child – caregiver match, part 1 (2:25)

Coping & competence - 1.2 Individual differences

Yes, temperament and parent behaviour are very much interwoven and there is certainly a constant bi-directional relationship. And it isn't even moment-to-moment; it carries a history with it. So we become almost conditioned to responding in certain ways to certain behaviours over time. But certainly a child who is, for example, more active, more reactive, more impulsive, less persistent, less regular in their rhythms, is more difficult for the parent if the parent has a different temperament. So a very low activity parent with a high activity child can create some real challenges because that parent's expectations are just not going to be met by the child, and there's nothing the child can do about it.

So in those kinds of situations, if the parent interprets that child's behaviour as being 'bad', or as being a threat to them, or as defiance, then they are likely to punish the child for simply being themselves: needing to jump, needing to run, needing to climb and be in motion. That's something that the child needs to do but if the parent doesn't see it as the child's temperament but sees it as constant challenge, then the child gets punished for being who they are and that child becomes frustrated, becomes resentful, feels misunderstood, feels they have to become someone who they are not.

And so I think it's really important for parents to understand temperament, not only of their child but also their own temperaments and really look at the match between their own temperament and the child's temperament. Because where they match, there's much less conflict. It's where they don't match that problems arise. And if parents can be helped to assess that, then their own responses can change dramatically because they understand more accurately the child's true motivation.

## Durrant – child – caregiver match, part 2 (2:16)

Coping & competence - 1.2 Individual differences

In most cases, children want to please us. They aren't trying to make us mad. They aren't testing us, they aren't being stubborn or bossy. They are simply being children, and they are demonstrating their own personalities and temperamental characteristics.

Parents can guide them. Parents can help to shape their behaviours. But they need to recognize that their own personalities can sometimes be contributing to the conflict; that it's sometimes the parent's own impulsivity, or the parent's own lack of persistence, or the parent's own high activity level, or reactivity that is actually eliciting a response from the child that then turns into a conflict. So I think if parents can look at this as two temperaments and two personalities coming together that neither one has a whole lot of control over, and then they run into situations where those two temperaments may not jive, then they can stand back a bit and look at the situation and maybe address it from a different angle.

So for example a child who jumps on the bed all the time: the parent may not want the child jumping on the bed because it could damage the bed. So they need to, the child needs to stop jumping on the bed. But what the child is showing is that they need to jump; that this is a physical need that they have. And so what a parent can do is, rather than spanking the child for jumping on the bed and telling them they're bad, or threatening them, or saying 'how many times have I told you', recognizing this is a child who needs a lot of physical activity: what can we substitute that this child can jump on? Maybe they could have a little trampoline or maybe they could set up some cushions or maybe there's an old couch somewhere in the house that they can jump on. And the child can get that energy out while not damaging something that is important to the parent. So in that way that parent would recognize the child's developmental and physical needs but also meet their own needs.

## Durrant – children's relationships (2:15)

Coping & competence - 3 Supports for coping and competence

I think the relationship with teachers and other caregivers is different. Those other caregivers might not feel the same pressure that parents feel to have the perfect child; to feel that their child is a reflection on them which causes…adds a whole other layer onto parents interactions with their children. However teachers and child care professionals are dealing with a large group of children at one time which most parents aren't which creates a whole other situation and set of challenges for them.

So I think they're different kinds of relationships, each is unique and each brings its own kinds of demands. But we know that in most places Early Childhood Educators are not permitted to use any form of physical punishment so they have found ways or received training and education in ways of managing a large group of, often, very young children and eliciting cooperation, respecting their developmental levels, meeting their developmental needs and I think that as parents we have a lot to learn from how they do that.  I think that's also true of teachers; that very skilled teachers are able to manage a large classroom without yelling, and losing their tempers and hitting children, I mean hitting a child in a school now a days is almost unheard of, and yet teachers are able to handle a lot of very challenging situations across a range of personalities and temperaments and abilities and skills and so I think that the kinds of skills that those people have developed could be very, very helpful to parents in thinking about how to manage frustration, how to communicate clearly, how to send clear messages, expectations, how to guide and model for children--what we hope that they will learn to do—how to distract them, how to build their competence and so on.

## Durrant – crying (0:59)

Coping & competence - 2.1 Early regulatory systems

When babies are crying, if a parent assumes that that baby is crying just to make them mad, which is not an uncommon assumption, then that parent is likely to either ignore or to get angry and to shake that baby.

If the parent has a recognition – recognizes the developmental aspects of crying, they're much more likely to say that child is signaling me about something, and I, as the mentor, as the teacher, as the one with the wisdom, knowledge, and experience, my job is to figure out why that's happening and to not respond with force because that doesn't make any sense, given the child's developmental level, but to respond in a way that is going to help that child learn that I'm here, that I -- they're safe.

## Durrant – discipline vs. punishment (3:12)

Coping & competence - 3.1 Understanding feelings and behaviour

Punishment and discipline are not the same thing. Many of us think they are and they get very easily confused. And this is true around the world, I've found that the word discipline is often associated even with military discipline and usually harsh punishment. That's kind of what it means.

So when -- in our minds at least so when we hear discussions of if adolescents in our communities are getting into trouble, for example. We often hear calls for more discipline and what often is implied by that is more corporal punishment, more harsh punishment, more coming down on them like a ton of bricks basically is what we call for out of fear. That response is really motivated out of fear of a feeling of lack of control. And that's true in moment-to-moment parenting as well is when we feel afraid. When we feel out of control and we feel powerless, we're much more likely to respond coercively, force-fully, harshly, and punitively.

When we feel like we understand the situation and that we're competent at dealing with it, we're much more likely to respond in a constructive way that moves us closer to our long-term goals. So this connotation that the word discipline has acquired is really unfortunate. It's become equated with punishment and the two are not equivalent at all. In fact, they don't even overlap. Discipline comes from the same root as the word disciple. And disciples are followers of a great leader. If you were a disciple of someone, you respect that person. You consider them wise and you follow what they do because you value what they have to say.

Discipline is the act that fosters that sort of feeling in people. So what we're trying to do is build that kind of relationship where the parent is a mentor and the child is a learner. So that doesn't come from punishment. Discipline is about teaching in an environment that fosters the child's learning. Children can't learn when they're afraid. They can't learn when they're anxious. They can't learn when they're stressed just like we can't. If we're afraid that our teacher's going to hit us, that our teacher's going to mock us or embarrass us or humiliate us, we're too afraid to try and it's through trying and making mistakes and having a teacher that helps us learn from our mistakes that we progress and we become increasingly competent and confident in our skills.

So discipline is all about teaching, mentoring. Punishment is about imposing something that the child doesn't like in the hopes that it will deter them from doing that next time.

## Durrant – intervening (1:56)

Coping & competence - 3.2 Getting along with others

Yeah well in situations where children are really doing things that are just not acceptable because they harm other people, they need to know that and there need to be clear limits to what is considered acceptable by the family, or the teacher or the caregiver. But I think that, in situations like that, it's very important again to think 'this is a disciplinary situation'. If I immediately think punishment, I might spank or yell or criticize or shame or humiliate or punish in some way whereas if I think of this as a disciplinary situation where I need to teach something very important then I approach it in a very different way. First I try to understand what is motivating the child's behaviour. Why is the child bullying that other child? Is the child, you know, lacking in social skills and unable to express anger in an appropriate or less harmful way? Is the child lacking in empathy? Is the child failing at school and feeling a need for a sense of power? What is behind the behaviour?

And if we understand that, then we can take action that will actually change the behaviour. And each of those motivations would lead to a different disciplinary response. But again discipline teaching. Discipline is communicating, explaining, giving information, helping children see another person's point of view, and setting clear expectations but not in a way that exacerbates the situation which physical punishment generally does.

**Durrant – introduction Positive Discipline (1:49)**

Coping & competence - 3.1 Understanding feelings and behaviour

The positive discipline program has three primary aims. One is to provide an answer to the question if I can't spank my child then what do I do? This seems to be a question that is common around the world and many people have a difficult time articulating what that response could be. Another aim is to provide an effective constructive alternative to hitting and yelling and to punishment in general so we want parents to really go away with actual tools and skills that they can use in situations of conflict and when they're feeling really emotional, frustrated and angry, which of course happens in parents daily lives and we also wanted to provide an explanation of what children's rights really means.

When we talk about children's rights in relation to discipline, often parents think that what we're saying is well they have the right to do whatever they want to do or we let them do whatever they want to do but that's not at all what we need. Children's rights in the context of discipline really means protecting them from violence and humiliation so making sure that we uphold their rights to dignity and physical integrity, and also their rights to voice their views so positive discipline is really centered around understanding the child's perspective and when we do that then we're much more likely respond in a way that makes sense to them, that they see is fair and that actually helps them to learn.

## Durrant – outcomes of punishment (1:21)

Coping & competence - 3.1 Understanding feelings and behavior

If they only learn through punishment, what we know from many, many studies of punishment is that when the punisher isn't present, there's no motivation for the child to inhibit the response. So if we only teach through punishment, then the child learns if mom's not there, I can get away with it.

Through positive discipline, through teaching and mentoring the child understands why it's important. So they're much more likely to make the right decision when we're not there, because they have internalized that knowledge and understanding. So they're much more able to stand up for themselves, to stand on their own two feet, to say no I'm not going to engage in that because I understand why this is important. Whereas the child who's been taught through punishment is more likely to say well, nobody's here to punish me, so I'll do that.

Resistance to temptation is much lower in children who've been taught through punishment than it is among children who've been taught through positive discipline, because those children have not acquired the skills, the knowledge, the ability to express, to communicate why. Whereas the child who's learned through positive discipline can say I'm not going to do that, because I know why, because this is why it's important.

## Durrant – scaffolding (3:34)

Communication & learning - 3.1 Guiding and teaching

Scaffolding refers to a process through which we teach children, by evaluating where they are right now in their understanding, what the next step in their understanding would be, and then giving them the information and support they need to get from where they are to that next step, not doing it for them, but giving them the information they need to gain that skill.

So then they move to the next level of understanding and skill. And then once they're there, we give them the information and support they need to get to the next level. So we might be modeling, we might be talking and explaining, we might be helping, we might be doing going part way and then help helping them finish the rest of it.

You know, I'll give another example of when my son was in school in another country, he learned how to sew, and he was about six years old. And he came back with a dragon that was as tall as I am. Now of course he didn't sew every stitch in that dragon there's no way he could have done that. But what the teachers did was use that project to teach them little by little. So the first step was let's figure out how you choose the fabric you're going to use. So they go the store and they talk about it all, and talk about how the different fabrics, you know, behave, and how they'll feel.  And then they teach them how to thread a needle by doing it over and over again, and helping him find it, and giving him, you know, a needle with a great big hole that'll help him do that easily so that he gets the feel of it and understands the action. Then they show him how to make a stitch, and then he starts to learn to make stitches. And he the first ones aren't very good, but they give him advice along the way, and model and model, and he learns and learns, and he gets better and better and better.

And that's really what scaffolding is. It's instead of saying do it this way, and then when the child doesn't succeed, saying well that was a stupid thing to do, or go to your room, or well, you know, do it'll you get it right, that's not helping the child. That's not helping them build their skills in any way, but saying well let's see what happened here, you know, what did you try? Okay, well maybe what if you try it this way? Try it this way and see what happens. Then the child is learning.

First of all, they're learning that they cannot do it correctly and it's okay, they're learning that they can come to you for more information and support, and they're going to actually acquire skill, because you're helping them to become problem solvers. So when they become parents, maybe they'll be better problem solvers too, because they'll say well that didn't work very well, that didn't go the way I wanted it to go, what happened here, what did I try, what else could I try, what might work better, why didn't that work, what's – what's going on?

So whether you're sewing, or whether you're cooking, or whether you're building a bridge, or whether you're building a house, or whether you're parenting a child, it's all the same process of just thinking okay, well why – what's

going wrong here, why are we not getting where we want to go, what else could we try, let's try that and see how that works for us.

## Durrant – understanding child development (1:08)
Brain development - 3.2 Observing child development

So we're really helping parents to refrain their negative perceptions of children's behaviour. So as opposed to kind of surviving it, looking at it as a thrilling development, and what a tantrum symbolizes for example in terms of the child's development. A tantrum might be something that a parent feels completely overwhelmed by, and many parents feel afraid that if they don't control that, the child's going to end up in jail when they're 16 or something. If they can understand that tantrum is the sign of their developing emotional awareness, then they can look at it entirely differently. It doesn't mean they hope their child has tantrums all day long, no.  And what we want to do is use those opportunities to help the child learn more about their emotional development, to acquire a little more emotional regulation each time. But instead of seeing it as brattiness, or stubbornness, or defiance, or non-compliance, help parents see it in terms of the developmental task.

## Favreau – dishonesty between parent and child (2:03)

Coping & competence - 3.1 Understanding feelings and behaviour

We've had an unfortunate incident with the family where they told their 6 year old child that they were actually going to a birthday party and, but in reality the child was coming to the hospital to have surgery, and the parents were just so afraid of what this would do to their child, thinking about going to the hospital and having surgery, that, I don't know, they just missed the whole point of what having a trusting relationship with your child is. The child arrived at the hospital and it was chaos for this child and the family. The child was not cooperating, was crying, was, you know, just so traumatized because when you mention the word birthday party, every child has a vision of cake and fun and balloons and happiness and no worries, and this was not the case of course. So the surgeon who was to do the surgery was, of course, absolutely furious and cancelled the surgery because there was no way that this could happen. They could not be a part of the parents' misconceived ideas of how they would address this issue with the child just because of the trust. I think the parents were spoken to and did then realize how wrong that was, and just that their child would never trust them again if this were to be the case. So it really is very important to be honest with your children to respect that they can handle so much more than we give them credit for, especially if it's the truth.

**Favreau and Kidder - medical play (3:15)**

Coping & competence - 3.3 Valuing play

We use medical play to help teach children about what they're going to experience in the hospital and the things they're going to see and perhaps come into contact with. So there's a wide range of medical equipment, band-aids, syringes, puppets and dolls, and we use whatever we think the child is going to be exposed to we will use.

Medical play is so important with children. It helps reduce their level of anxiety, their fears, the unknown. A child's imagination can go from zero to a million, and so when we actually show them the real things about what really going to happen and what they're going to experience, the people that they're going to see, the smells they might smell, what they're going to experience as a patient, what they're going to wear, where they're going to be staying, their anxiety level comes down so much, and their parents as well, because if parents are nervous about what is going to happen, and sometimes it's all new to them as well, they may not have had experience in the hospital as a child, and so here's their little one going, so their anxiety comes down amazingly, so, and we know children feed off of anything their parent is feeling.

When we invite children to engage in medical play, in health care play, we're inviting them to share their experience. We're asking questions, they're asking questions; it's a two-way conversation. In that supportive dialogue relationship we're able to validate a child's experience. In that time a child might say I had an i.v. in my foot, and then I had an i.v. in my head, and then I had an i.v. in my arm and it hurt! You've had a lot of needles, I appreciate that. Sounds like those needles hurt you, and go on from there. What kinds of tools did you use to help you when those experiences were happening? The interaction during medical play invites opportunities for dialogue and for children to be heard, for their experience to be validated. For us to say, "You did a great job!" For them to hear that, you did a great job. For them to experience some sense of mastery. To walk out of here feeling they entered a challenging experience, they learned about it, they applied a coping strategy, and by golly, they managed.

The whole idea here is children are important. Children need to participate. They are not just coming in to have something being done to them; they need to be active participants. We invite them in to the play because play is their world so we're going to normalize this preparation by using an approach that we as child educators are familiar with and we know it works.

## Fourre – mossbags (2:20)

Brain development - 3.3 Caring through everyday experiences

My understanding with the moss bag is that it was in a way a wrap that they would use in the community. Would take moss - the women would gather moss and they would clean it and they would let it dry. They would wrap the baby's bottom in with the moss using - could use leather.

And the moss could be used over and over again. The moss had healing properties, so there was never a diaper rash and - so when the baby was wrapped in a moss bag, similar to this one, they were - it was giving them a sense of security, like a security blanket would.

So they would use the moss bag, they would travel with the baby going berry picking or, you know, cleaning down at the river so that the child would actually be with somebody all the time. The mother would be carrying, the father could be carrying.

One of the things I thought was so amazing when I first heard about - was the teaching of the four sacred - like the sight, the hearing, smell, taste was placing the child forward. It would usually be a girl baby placed, being placed forward so that she would learn to take care, to pick berries, to know how to clean a fish, to - for cooking. So she would smell she would see.  You know, she would be able to see all the different things that a girl baby would need to do, the roles of the women.

And a boy baby would be placed backwards, so that his far sightedness would be developed, so that he would be able to see the animals, the birds flying, he would be able to see the role of everybody and see the community and see the role of - the men had and the women had. So those - that would be developed with a baby that was placed backwards, the boy baby.

## Furman – inclusion (1:33)
Communicating & learning - 3.2 Planning environments for learning

We consider access, adaptability and participation. Our inclusion philosophy is really around belonging. We want every child to feel that they belong here. We want them to see it in the books that are offered. We want to have it be seen in the types of foods we offer. We want it to be seen - we go out of our way to make sure that the equipment is exactly - very similar to what other equipment is available. So for instance we'll have a chair that's really low to the ground so that child can participate during circle time or meeting time. So they're all at the same eye level. Or we've had equipment adapted so it's at the same height as all the other chairs in the room, so when they're having a meal together they're at the same - at the same height. So we're very intentional and purposeful of ways that we can include children.

We have many medical complex children, which will range from anything with severe asthma, allergies requiring epi pens, seizure disorders. We also have many children who are tube fed, some that require oxygen and some that require suctioning.

We want everyone to feel like they belong here and regardless of their abilities, that we will make it a home away from home for them.

## Furman – involving parents (4:25)

Ecology of Childhood - 3.1 Sustaining home life

We absolutely believe that parents are the child's first teacher and the experts of their children, so it's really important to involve and to continue to build our relationships with families. So it doesn't just happen at orientation and then just, you know conversations at the end of the day. We host family events regularly so that families can be involved with their children. We host lots of different kinds of events monthly, anywhere from a holiday party to an art workshop to invite them in for our yoga classes. Families are also welcome to attend all of our music classes and other sort of specialty programs that we have throughout the program.

We like to have a variety of different ways that families can connect because we understand and that families are really busy as well. So someone might only be able to attend a couple a year where if there's maybe other families who can attend regularly - so whatever parents are able to do is what we want to support.

We're always analysing our parent manuals to make sure that they continue to be family-centred. We also have adopted a particular app that we use on our iPads. All of our rooms have several iPads and so we have this app where a parent will receive an email every single day of what their child has done throughout the day, which includes video and pictures and pictures of other children, so that they can see that they have made friendships and that they're socializing. And that has been such a highlight to so many families.

We offer literacy book bags in all of the classrooms, so that not only hopefully increases children's love of learning and love for reading, but it also brings us that connection between centre and home again. So there's a little sign out sheet. The book bags are based on either our favourite illustrators or authors, or sometimes on concepts such as, you know, math or the alphabet or colours. So families get to sign those out. It doesn't just include the books. It will include sometimes markers or crayons and paper. Some of our books come with little stuffed animals, like Mo Willems' Piggie and Gerald. So we had Piggie and Gerald in the book bags, and a little camera as well. So then families can document their children's time together. And so we'll print those up and add those to their child portfolios.

We also have an extensive library, and being, again, within SSCY there's a family resource centre, so we have connected families to that. We have a library card with them so we can take out books or instructional videos. Try to - other kinds of conferences that happen within SSCY. We can have our families attend those, such as the autism seminars that happen here. So many of our educators and families signed up for that as well.

I think we have a wonderful relationship with staff and parents. We're always looking for different ways that we can connect with them. We have these - typically they've been these monthly family events, so anything from yoga to music to - we've done lots of art workshops. We had a mindfulness evening with our families. My school age program

has this parents versus dodge ball evening. And pizza parties, and so really are always looking at different ways to build that connection between home and the centre.

And I would say finally our IPP meetings or Individual Program Plan meetings. So for children with additional support needs my inclusion support facilitator does a fantastic job of putting together a PowerPoint presentation of tons of video and pictures, our favourite pictures of the child with other children, and so that's how the meetings always start, strength based, videos and images of what the child has done to this lovely slideshow.
We also do every year a Survey Monkey feedback form. So we want to have ideas of how we're doing, where we can improve.

## Furman – parent perspective - inclusion (2:50)

Communicating & learning - 3.2 Planning environments for learning

They include my son in every single thing they do. And he's been participating in different things like crafts, which he would never ever have been interested in unless somebody pointed that out to him and helped him. Things like playing in the water, things like being outside and just playing in the nature. Like there's no toys outside, it's just a hill with grass and some trees and some flowers and I've noticed that he just loves doing that here.

And I feel that it doesn't matter what disability your child has, they will always make the adaptions that they have to make that child feel comfortable. For example, my son has a rocking chair that he sits in at the table when he's eating. And they purchased that specifically for him because they knew that he liked to rock and that he had a rocking chair at home. So they kept it consistent for us and he uses it when he reads and he uses it when he eats.

If he's having a hard time learning things, they just make it simple and find ways to make sure he's having fun and happy and that's what matters to me is that he's happy and included. And that's exactly what happens here every day.

He has an adapted bike that he's had made for him through the Children's Rehabilitation Center and it's amazing. They actually keep it here for him and allow him to ride his bike in the hallways through the wintertime so that he can continue to learn.

I think this daycare means happiness to my son. I would say that my son is happy 99 percent of the time when he's here. Unless he's sick or something's really wrong, there is no reason for him not to be happy and he shows it. He shows it through his kisses, his hugs, he shows it through the pictures that I get sent home, the videos.
The way that the staff treat my son and the way that the educators work so hard to make sure he's happy, it's all that matters to me and it's of course for a child being happy is the most important thing. He's made friends here, he's gone to birthday parties, he's learned how to interact with children, which he never did before. And he's learned to trust the educators and to have a personal relationship with them. My son has been so happy here that I feel like I want him to stay here forever and I don't want him to go to kindergarten.

## Guhn – SES gradients and policy decisions (1:32)

Developmental health – 2.2 The gradient effect

The Socioeconomic Gradient of Health is very very prevalent not just in BC but around the world. You always see that the children who have access to the most resources are doing relatively well and the ones who don't are not. But there's not a cut off, there's not a magic cut off. You see that this threshold holds at every level of socioeconomic status. And of course it raises questions about equity and inequality. How come that in a society in which we have a lot of resources, a lot of wealth overall a lot of the children are cut off from the access to these resources and what can we do to change that to make it a more equitable society. So what we see both on the EDI and all of our other measures that there are very, very stark socioeconomic gradients in regards to children's well-being, in regard to their academic achievement, in regard to other indicators of their health and the question is why is that the case. So by providing that information at the local level to policy makers, to schools, to parents, we're trying to also motivate people to do something about because there's – from an equity perspective, from a child right perspective, from an ethical perspective - there's nothing to justify that we see these extremely stark differences between the haves and the have nots in virtually every outcome that there is.

## Gunnar – impact of child care (3:26)

Ecology of childhood - 2.2 Early childhood education

One of the things that, as I did discover in my research which I had not anticipated, and I've spent quite a while following up, is that if I watch children at child care, they elevate these stress levels over the day. That's a very unusual pattern; normally we start high and go down as our normal diurnal rhythm. But they go up over the day. They go up especially in poor quality child cares, but they go up in any quality child care. I've never found a child care quality place where we don't see elevations over the day, especially for the younger kids. It's an age-related phenomenon.

So our babies don't do it as much as our toddlers. Our toddlers, up to about age two, they're showing the largest increases, and then by about five you don't. Now that's nervous making. Does it matter? It is affected by the quality of the care giving. We know that the more intrusive, over-controlling caregivers are the ones who drive this up more, They're creating contexts that are developmentally inappropriate. They're trying, they're doing tons of circle time with two-year-olds. They're doing "learn your ABC's". They're intrusive and over-controlling and they're creating a context that's just very over-challenging for younger children.

And hostility on the part of the caregiver, that's no surprise, will drive these hormones up. They also drive the behaviour, and, I mean, this is no surprise, the behaviour and the hormones are telling us pretty similar stories.

To try to find out if it mattered, the kids we've always been more concerned about, are the ones who are more anxious and fearful. Because, I explained to you, what parts of the brain should this be affecting? The regions that are regulating anxiety and fearfulness. It should be tipping you towards being more anxious and fearful, if you are anxious and fearful, you activate stress biology, it becomes like a little snowball going down the hill. So, we've in research where we were studying children in family day care, we did that not because we thought family day care was more stressful, if anything, it probably should be less, but we wanted to have one child in each child care so that we didn't have to statistically worry about trying to control for multiple kids in the same settings etcetera.

So we were studying children in family day care, we observed them, we collected their saliva, we tested them in the laboratory to know how fearful and anxious they were, we followed them up six months later to see how their behaviour had changed. And what we found was, if you elevated cortisol across the day and you were not very fearful and anxious, it didn't make any difference. The stuff went up. Yeah, fine, went up. If you were high anxious, and you elevated over the day, you became more anxious over time. If you were high anxious, behaviourally inhibited, and you were in a context where you weren't elevating, you decreased your anxiety at child care over time. You became less fearful and anxious.

We've had a debate for a long time over what's the impact of child care? And what should we do for fearful and anxious kids? Nathan Fox has said, "Oh great. Send them into child care. It reduces their fear and anxiety". But other people have found that, "Gee, those are the kids, who if they're not in good quality care, actually show increasing problems". Well, this study is right. They're in the mix. So if you're fearful and anxious, a little inhibitive kid, and you're in child care where you're not elevating, you're learning to be less fearful over time. If you're in a child care where you're elevating, you're retaining all that information about every single instance where things were scary and it's becoming more fearful and anxious for you.

## Gunnar – importance of the early years (2:06)

Developmental health - 3 Advocacy

So you're spending a lot of time trying to helping people understand the importance of the early years. And this is something that science is now, I think, in a much better position of being able to help people understand that the early years are not just important for an individual's development. The early years are important for a society's development. It's an old saying that, you know, our children are the, you know, the nation's future, but we're beginning to understand what that really, really means on a biological and scientific level. We're beginning to understand that our concerns about health care for the older generation, the seeds of those problems are sewn in early development.

We're beginning to understand how early adversity increases your risk for cardiovascular disease. Boy that costs a society a lot: for diabetes, for obesity, which of course is also, you know, influences diabetes, all sorts of health problems for alcoholism. I mean you have to, it's not just modeling that people are drinking, but these early adversities shape the way your nucleus accumbens  functions, and your dopamine system and it makes you at risk for becoming an alcoholic if you ever start drinking, etcetera. We're beginning to understand this biology.

So if we want to have a society where we can solve our problems, and we have people who are making enough money to pay enough taxes, so that we can solve our problems, we need to worry about what we're doing in those earliest years. We know that we can probably always do things that will fix what didn't happen right early on. But to fix it is costly, it's not as certain, and our biggest expense, of course, prisons which fix it by getting rid of them, are probably some of the most expensive things we can do and we're understanding the biology of how early adverse life events increase the risk of these negative outcomes later.

71

## Gunnar – measuring stress (2:45)

Brain development - 2.2 Stress

It seems very odd to people when I say well, I study stress, I study the stress hormone and the first thing they ask is how do you get measures of this? And I say I just take spit and that's very strange but the logic is simple. When we produce this hormone in the adrenal it goes into our bloodstream and goes around and does its work in the body but some of it seeps out into saliva through the parotid gland. The part that seeps out is the part that is actually not attached to proteins and that's the part that's biologically active in the body.

So we can measure the concentration of this hormone in saliva and get a very accurate index of its concentration in blood. And that's why we measure it in saliva and of course with kids it's great, it's an easy thing to do with many children. Nothing is easy with all children but most children are happy to play our games. We don't ask them to spit. Surprisingly little kids don't like to spit. They'll spit if you tell them not to but not if you ask them to.

So we use various techniques. One of them is a little bit like dip-stick candy. Maybe your students know what that is. We give them a roll of a long strand of cotton and a little cup with a few grains of sweetened crystals in it. They dip it into that, eat it, dip it again. The wetter your cotton is the more you're collecting all the little grains and then we just take the cotton away. And as far as they're concerned they've played what we call the tasting game.

Alright let's show them how we play the tasting game. So here's one for Nicholas. And Solomon if you decide you wanna try. So what do we do first Nicholas? Take your special stick. This one is for you, right there. Take your special stick and get it a little wet on your tongue. And then dip in that little powder and what colour does it turn? A little pink? And back on your tongue. And taste that powder. And you've got all that powder right on your tongue. And get it really wet. And when it's really soggy wet, put it right back in your cup. And that's the tasting game.

Non-invasive and it allows us, because the kids like it, to do it repeatedly so we can study them over the day. We can study them over a session in the lab taking as many as six samples in two hours. We can study them across days in child care and it's so simple parents can collect for us at home which allows us to look at home versus another setting.

## Gunnar – playing with peers (4:09)
Ecology of childhood - 2.2 Early childhood education

We've been studying children in child care, not because we, we started out not because we're interested in child care but we were interested in children's relationships with other children. One of the things that we know that's very critical for stimulating stress reactions and controlling them in people is our relationships. We know that secure relationships with adults is very important in children, in buffering activity of these stress systems. And peer relations begin to be very important for children in the preschool years. Whether you have friends, whether they want to play with you, all of these sorts of things become very, very important to children. And it seemed to us that the peer network was a very good place to look, to understand children's capacities to regulate stress. As peers would cause stress to one another that we couldn't cause in a laboratory experiment. So we began to study peer relations among children and we have found that even as young as three years of age children who are not liked by other children have higher stress levels when they are in group settings. We were very interested in studying this in children, we were studying it in our nursery school, kids come for a half day, and we know that it's just very unlikely, most children don't get to go to a half-day nursery school because their parents are working full-time so they're in full-day child care.

So we thought we'd better be looking at full-day child care to make sure that this finding about peer relationships held. And as we started to look at full-day child care we thought yeah, we can see these peer effects, but the overwhelming effect we're seeing is that children are actually showing increased in this hormone across the day. So we didn't stop our peer studies, we're still doing those, but we began to focus on what is causing this rise? Is it how complex peer relationships are, so that if you have to negotiate that landscape for eight hours you're worn out? Very possibly. Is it something about the quality of the care that children are receiving in full-day child care? Does that make a difference? And it does. So we've really begun to focus on child care as a normative challenge for children. Some children show large elevations across the child-care day.

They tend to be more fearful children, they tend to be the ones with fewer people skills, they tend to be the ones children don't like, they tend to be the ones that teachers are sort of happy when they don't show up because the classroom is easier to manage. They're those kids and they show quite large sometimes, elevations. We see much larger elevations in care settings that score lower on the quality indices that I'm sure you're teaching your students to understand. So as quality of care decreases, more of the children show increases and more of them show larger increases.

And it varies by age. Toddlers are the ones that seem to be the most susceptible. And we're not sure exactly why. We think two things may be going on. One is that as you switch from the baby room to the toddler room you go from a setting where even though there may be 12 babies in the room, many of them are asleep, they're all on different! schedules. So the number that are present to interact with and the number that any adult actually is dealing with at any particular time is pretty low. To a toddler classroom where everybody's on the same schedule and so there's typically several adults and many, many children that you have to negotiate all at one time over the day. You're skills

are not up to it. You're learning. It's like going to graduate school or college. Right, you're two, you're going to college, you're learning peers. And groups. And it's hard work. And you're stressed. And you're more stressed the less competent you are. As kids get a bit older the day is less challenging until we see by six and seven years they look like they're at home. Right. They can do eight hours of peers and teachers and it's not overwhelming to them.

## Gunnar – prefrontal cortex (1:58)

Brain development - 2.2 Stress

The regions in the prefrontal cortex, the higher order thinking and reasoning regions of the brain. But some of those regions in the medial –middle-- area are involved in stress regulation. The logic here, nature's logic, seems to be, that if you're going to grow, if you're going to live in an environment of threat, you need to be an act first, think later person. And so these biases you're seeing, and what's happening to the brain, are getting you to perceive threat and react, and the prefrontal cortex isn't saying, "Wait a minute, let's think about it. Should we run? Should we not run? Was it a tiger? Did it have stripes?" It's going [slap] "outta here!"

And you're getting bias towards that. That's what we think is happening. We're looking for evidence of it. It certainly fits with what we think is one of the biggest challenges for children who grow up under really chronic stress. Which is they get into environments, like school, where they need to think, a lot, and inhibit action, a lot. And it's really, really hard for them. Especially when there's any distraction around, especially if anything's going on at home, which it often is, which is making them feel more anxious that day, is that they really are getting tipped toward act first, think later.

And the school context, the context we need for making a really good living, is a struggle because the brain, through eons of evolution, has mapped itself towards survival in a very different kind of environment. And we're learning ways to help those children rewire, right, and we're looking for evidence. The clearest evidence we ever see is a reduced brain volume, especially in the prefrontal lobes. That's been the, I mean, consistent, over and over and over and over again, our finding the prefrontal cortex really struggles to develop in the context of adversity.

## Gunnar – relationship buffer stress (2:14)

Brain development - 2.1 Nurturing relationships

So, I spent a good part of my early career trying to understand what regulates stress in very young children who were too young to regulate stress by controlling and predicting and all of those things. And the biggest thing was relationships. So what regulated, incredibly powerful stress regulators, to be in a secure attachment relationship with a person who is present. Not just to be in a secure attachment relationship and that person isn't present, but to have that person present and you trust, and we're still trying to figure out but I think it actually influences a region call the orbital frontal cortex, and it probably actually short circuits the signals to stress biology.

So what, for example, we studied babies when they were going to their Well Baby checkup—I use doctors a lot to stress babies because they could do things to make the baby healthy that were way more stressful than I could do— and we were interested in the physical exam and the shots that babies get. Two big shots. One in each thigh. Two months, four months, six months, and sometime in the second year. And we followed babies over those shots, and boy, at two months they're little bodies were going off like crazy, but that was probably okay because they don't have all those receptors yet for stress biology.

And then it began to shut down and by 12 months, they didn't elevate at all. Now, they cried like heck. They hated having shots. Their heart rates went up. But their cortisol didn't budge. Unless they were in an insecure attachment relationship with their parent, in which case it activated, not horribly, but it was as if the presence of that secure relationship was serving as a buffer. And the less secure relationships were sort of leaky buffers. We of course know that if you take that buffer away, if you send a child to child care, and they're alone, they've lost their buffer and they haven't yet made the relationship with the person in the day care centre, it's going to take weeks of every day that baby's going to elevate, a lot. But after a time, after about two, three weeks, they only elevate a little bit.

## Gunnar – sensitivity and responsiveness (2:49)

Brain development - 3.3 Caring through everyday experiences

So we constantly hear about the importance of sensitive and responsive care and the challenge is figuring out what that actually looks like. One way to translate that that we've talked about is like a game of tennis. Serve and return. This is the basis for all early learning is that kind of serve and return, you have with a sensitive and responsive adult. So the baby goos and you respond.

The challenge is whether you're responding too much and that's where the sensitive part of this comes. I don't know if you had a hovering mother. Luckily I did not have a hovering mother, but the kind of parent that is just over you all the time. Every little breath you make. They're there. They're wiping your face. They're looking at you. They're trying to be, they're being so responsive they're driving you nuts. That is over-responsiveness and it's not sensitive to what the child needs. And that's why we have both of those words: responsive and sensitive.

So, it's critically important to be able to read the child's signals to figure out when they need you and when they don't, when it might be important to step back and say, "No, you can do this" or when the child falls down say, "Oh, you're fine. Get up" kind of thing is actually more sensitive than, "Oh poor baby you fell down. Are you all right? Oh my goodness". Because what you're trying to do as a parent is to find that balance between what my child wants, what my child needs, and where my child needs to be tomorrow.

And you don't want to under-respond: "Oh, you're fine. Get up". You know, my parent never understood that I had needs. "You're fine. Get up." But you don't want to over-respond. It's a tough job being a parent. It's a horribly, horribly tough job. Some kids are much more forgiving than others. They can grow up into being robust kids in a range, even if we don't quite get it, none of us by the way get it right, and a robust range of us getting it wrong, other kids are more delicate. They need a bit more, the range of your variation is a bit more narrow.

But of course we can generally judge by watching how the kids are. And if you're watching families, if you're watching families, I sometimes tell my students to stop thinking and just, "How do you feel?" If you're watching and you're feeling is "Ahh, that feels good", then that's probably they found a reasonable balance. If you're watching, you're getting tense, and you feel like, "Eww, I don't know what's wrong but I don't feel good watching this", something's off and when you do the analysis you might be able to figure it out.

## Gunnar – stress biology (3:13)

Brain development - 2.2 Stress

The research I do is research studying the effects of the biology of stress on human brain and behavioural development. Stress is a, the biology, the physiology of stress, is a really important mediator of the experiences we have and the impacts that that has on our brain development and our physical and health development as well. So, I'm very interested in that biology and we study that to try to understand how experience, some experience, especially adverse experiences, get under the skin and shape the way that we develop and our health.

So there are two arms of the mammalian --we're mammals—of the mammalian stress system. One of which people are very familiar with because we get really direct feedback from it. And that's the sympathetic adrenal medullary system. That's the adrenaline surge system. The one that you have a fright experience, you feel your heart suddenly racing, you get a lot of energy and you can run like heck for a very long period of time. The fight-flight system.

And we get measures of that by measuring heart rate. We can look at the two sides of the nervous system: the parasympathetic calm down side, we measure something called vagal tone. It's the extent to which you have variations in heart, in beats, timing between beats, that's related to respiration. And that's what the vagal system does. And the sympathetic arm of that system which we look at as something called pre-ejection period: the time between when your sinoatrial node says "beat", and your heart beats.

And so when you have more adrenaline flowing, that's shorter. So, the heart says, "beat" and it goes. Okay, so we can measure autonomic activity to get an idea of the fight-flight side. Also supporting, and extremely critical, is the hypothalamic pituitary adrenal cortical system. Notice that the adrenals are involved here in both sides. This is the outside part of your two adrenal glands. It produces something called cortisol in humans. It's a steroid hormone and it organizes long-term responses to stress.

So it helps you to sort of go from running immediately to being able to sustain that for a longer period of time. It also shapes the way the brain will respond to the next adverse experience. So we're very interested. My lab is particularly interested in that side of the stress system because, in terms of that question, how does it get under the skin and shape the way we develop, I'm interested in the regulation of that hormone which will shape longer term responses to stressors and life's challenges.

And we measure that in saliva. Because you produce this hormone, this steroid hormone, it goes into your blood stream, and some of it just seeps into your spit. So I can collect saliva and get a sense of how much of this has been produced in the child's body.

## Gunnar – stressful events (2:19)

Coping & competence - 1.2 Individual differences

So in thinking about the kinds of stressors that children can encounter, we've talked about sort of the positive kinds of stressors. Right, where the child is actually in their repertoire to maybe figure out how to deal with it. There's a supportive caregiver around. They're developing competence while they're doing it. And we've talked about toxic stressors where there is no supportive caregiver, or the caregiver's gone over to the other side, the child isn't able, and they're producing chronic activation of stress biology which is wearing the system down.

There's an intermediary, or a different type that we talk about that is tolerable. Stress. And that's, boy, big activation of stress biology, typically because of things that are way outside of the range of what a child can deal with on their own. Natural disasters. A terrible car accident. Death of a parent. We can go down the list. Famine. War. But we know that in those contexts, still, the most important predictor of whether the child will do well is, is there someone who is serving as that protective, supportive other that can step in as the biggest mediator of this. If there is, then the child will probably be able to do reasonably well. Maybe even learn something from those situations.

But if the, unfortunately, what makes those things shift over to toxic stress, is they frequently break the caregiving system also. And that's why as a society, we try to step in when we're doing it right to re-establish a caregiving system in those contexts. But we're not always very successful.

It needs to be someone who can be consistent, responsive, I mean we do what we can right. I mean if the caregiving system is completely broken we try to identify somebody for at least a period and then try to get them into permanency. It's that shift to permanency we often struggle, struggle with. And in many contexts, there's just not the infrastructure to be able to do that. So there are a lot of kids worldwide who are growing up learning to act first, think later.

## Gunnar – stressors vs stress (3:42)

Brain development - 2.2 Stress

So when I start talking about stress and the impacts that it can have, the story sounds pretty scary. And very quickly parents and educators would like to remove all stress from a child's life which is really a bad plan. In research on stress, we distinguish between those things that can activate stress biology, and we talk about those as stressors, not as stress, because not everyone will react the same way.

We talk about stress as the actual activation of the biology, because in terms of what can impact the body, it's the activation of the biology that we've got to be the most concerned with and the way the body reacts to that activation. So, on the side of stressors, everybody's a little different when we start talking about things that are milder. So, I don't know about you, you might like to ski, but being on top of a mountain on skis, looking down at that little clubhouse down there is a massive stressor for me because I don't know how to ski and I'm going to kill myself trying to get down the hill.

So how we react to events has a lot to do with our interpretation of those events. Whether we feel safe, or threatened, or whether we think we can control those events, or not, whether we can predict when they're going to happen, or not. And for young children, especially whether we have a partner with us who is capable of providing safety.

So that's the stressors side, and we can talk about all sorts of particulars. The stress side, we're designed to be able to activate these systems. We need these systems. If you can't activate these systems, you're dead meat. And we know this because, in premature babies, for example, sometimes as a result of being born so premature, they're not able to mount effective stress responses. Those babies have terrible blood pressure. They're at risk of dying. They're actually given stress hormones to try to get their blood pressure up and to try to get them capable of managing.

So we have to be able to activate these systems. But these systems, along with doing wonderful things to mobilize our energy, and focus our attention, and help us remember what's dangerous and threatening and so on, are also very catabolic. They're all about breaking down energy stores, making nerve cells shoot, and fire off and create chemicals, etcetera. So it's like too much of a good thing. It really becomes a bad thing. So, if you're chronically activating these, running them high, then you're sort of, you're producing incredible wear and tear on the body. Something that's been called "allostatic load".

So we're preserving ourselves through activating these systems, allostasis, but there is a cost to that; an allostatic load. And it's all that allostatic load that builds up over time and creates big risk for mental and physical health including diabetes, and cardiovascular disease, and effects on the immune system, and increased risk for emotional disorders, and learning problems.

With young children, these stress hormones are even more problematic if they're run unchecked. Because the brain is developing itself in the context of these chemicals that are potentially creating problems, and are shaping a highly anxious, fearful brain. So, anytime in life, chronic stress ain't so good for us. Chronic stress. Chronic activation of these systems. Early in life, we're building the brain, and the context of chronic activation, and that's sort of a double, double issue

## Gunnar – toxic stress (1:55)

Brain development - 2.2 Stress

So, when does it become toxic? That depends on the individual because some of us are a little more robust, we have better repair mechanisms. We're still learning about what that biology of repair mechanisms are about. We have neurotrophic brain growth factors that can fix things and so on. Others are more vulnerable. Many, for various reasons, some of us are better able at turning off stress.

So there are all those individual differences. Genes are going to be important. We vary. The experiences we have during development that write on our genes and affect how our genes function, are going to influence it.

But we do know some things that are very, very difficult for most individuals, and certainly most children, to deal with. And repeat after me. We can always, we can all go down the list. They are those kind, and we call these toxic stressors, that is they're likely to produce toxic stress: maltreatment, physical abuse, sexual abuse, severe neglect, repeated loss of caregivers, bouncing from one foster care home to another, living, growing up in a context of having extreme violence. They're all the things that we know, and in fact, one good way with young kids to figure this out is, if you're not growing behaviourally, if you're falling behind on your developmental milestones, if you're not physically growing as well, that's a pretty darn good indication without taking a spit sample, that what you're seeing is a child who is experiencing chronic stress.

Because part of the whole stress biology is, influences those things. We put growth on hold. Because we're trying to survive in the moment. So growth goes on hold. All aspects of growth go on hold to try to survive. And you just don't develop as well.

## Halfon – preventing problems by investing early (2:07)

Developmental health - 3.1 Advocating for early child development

When one looks across some of the nations and you see that Canada, Australia, England and the US, we're all countries that were established under a, an ideology that really comes out of the Elizabethan poor laws that basically said that children and families had to fail between, before government was going to step in. What we've seen in the last 10, 15 years, with all the brain science, and all of what is learned about early child development, what we know now, is if we wait for children to fail, and wait for our systems to detect that they've failed and then intervene what we're going to do is, we're going to is, we're going to send lots of children into very low trajectories. Because once you intervene at age eight, or nine, or 10, for learning problems, behavioural and other things that could have been assessed and diagnosed or prevented at age two, three and four, not only is it very expensive to do, it's not usually as effective as preventing the problem in the first place.

And so what we're starting to recognize is that we need to revamp our systems. We can't use the old ideology, we can't use the old rescue tactics, and we can't just focus on the disabled, but we really need to be thinking about how do we actually have, as is the meeting laid out, you know, "Equity from the start", how do we actually optimize development from the start, how do we make sure that the developmental trajectories of children are, you know, reach their maximum potential by design, not be default. And so that's a different way of doing things. So what we're starting to see, in the English-speaking countries, as they try to, you know, throw off the yoke of the Elizabethan poor laws, is that they're beginning to think about, how do we  restructure and re-engineer the systems.

## Hertzman – barriers to access (1:12)

Ecology of childhood - 3.1 Sustaining home life

The barriers of access to programs for children's services is an absolutely crucial issue. From the standpoint of families, there are 10 problems that we've identified over and over again.

First, a program or service simply doesn't exist in an area. Second, it may be too expensive. Third, there may be transportation barriers to getting to programs. Fourth, the programs may be offered at inconvenient times. Fifth, there can be problems of social distance between families and the providers that lead to trust barriers. Sixth, there can be language problems. Seventh, there can be problems of system fragmentation so that you can't get your kids all the places that you need to get them. Eighth, there can be problems of conflicting expectations where you would like things to be organized in a certain way but have no voice in that. Ninth, you have the problem of parental consciousness per se, that is to say there's no adult within the child's environment at all who is conscious of the fact that, let's say, a child who's three-years old not saying a single word, that that's maybe an issue that ought to be looked into. Then there's one other one that I've forgotten.

Anyway, there are a range of those kind of barriers that exist and we have not addressed those barriers systematically.

84

## Hertzman – British birth cohort study (2:12)

Developmental health - 2.1 Social determinants of health

Yes well, I've been working on this 1958 British Birth Cohort study for about 10 years. And I think it's a very important study because it identified all of the children born in the first week of March, 1958 on the big island of England, Scotland and Wales; there's about 17,000 in all. And we've now followed them into their mid-forties and still over 10,000 of them are in the sample. So it's a very large number of people to see how development unfolds over time and how things that occur early influence outcomes that occur later on in life. I've been working on it since the age 33 follow-up and so a lot of the work that I've done to date is about how early experience influenced health and well-being by age 33. One of the key results that I've used over and over again in my work is that we found that three factors in the early time in the kids' lives were influencing health and well-being at age 33, irrespective of other experiences. And the three factors were one: Whether or not the kids had been read to consistently early on in life, two: How easily the child adjusted in school from a social and emotional standpoint and three: What proportion of their adult height they reached by age seven.

And the way it worked was that the kids who were read to consistently had an easy time adjusting into school and were growing relatively rapidly as a proportion of their own adult height, were only one-fifth as likely to be in a state of poor health by age 33 than those who had not been read to consistently, had difficulty adjusting into school and were growing relatively slowly even after you take into account everything afterwards. And the way I've interpreted that result is to say each of those three variables points to one of those broad domains of development I mentioned earlier: the reading variable pointing to the language and cognitive development domain; the social and emotional adjustment to social and emotional development; and the early growth to physical development, right. And so for me, the connection between what we've seen from the '58 British Cohort and what we're talking about in the Canadian context is that the key domains of early development are all of a piece.

## Hertzman – developmental health (2:45)

Developmental health - 1 The developmental health perspective

Well, developmental health then is basically this concept that arose out of looking at the early childhood aspects of population health. In other words, it's got to do with a state of doing well across those three broad domains of child development I mentioned earlier on: the language and cognitive, the social and emotional and the physical development. Now people divide it up in different ways but that's the way I like to do it and so developmental health basically means, you know, doing well across those three different domains, right, and of course, then in turn, what's important are the factors that influence that, you know, and those factors begin obviously prebirth and carry forth. Some of them are socio-economic in nature and clearly the more resources that families have and the more control they have makes a difference for how kids do.

But things like parenting style make a huge difference. Being an interactive, flexible parent leads to better developmental health than say being an authoritarian or apathetic parent. Similarly providing a rich language environment in the home makes a lot of difference. And then factors at the neighborhood level make a lot of difference as well. Neighborhood safety, cohesion, having mixed neighborhoods rather than poor ghettos all make a difference. And then the quality and accessibility of services make a difference as well. Quality child care makes a difference. Having timely access to things which will pick up vision, hearing, dental problems and so forth, all make a difference. And so those things all layer on top of each other. What it means is that in a society like Canada, where we haven't done a particularly good job of actually delivering universal access, if I can say, to the conditions for healthy child development, that by kindergarten age you can already see large socio-economic differences emerging in how kids do on those three broad domains of development. And you know those differences are largely preventable. And so developmental health, I think, is about addressing those things.

The real question though is whether or not the gap between kids at the top and the bottom of the socio-economic spectrum in terms of their development has been widening or not over time. And we just don't know. What we do know is the gap is wide now. And it is certainly true that now we're in more and more of a knowledge-based kind of an economy that differences, for instance, in kid's ability to cope with language and cognitive concepts and also on the social and emotional side, people being able to operate in a workforce where you have to be very interactive, presumably is going to bite pretty hard for people who don't have those skills. And so the cost of differences in developmental health is definitely going up.

## Hertzman – early childhood educators (1:17)

Ecology of childhood - 3.2 Strengthening early child development programs

Well, I think it is clear when you look at environments that work for children that ones that are rich in language and responsive, and ones that are well-managed in terms of the social and emotional environment are the ones that work the best. So I think when we're talking about taking more community responsibility for children now, we have to be very cognizant that we want, you know, a critical mass of the front-line staff to be verbal, to be interactive, to be socially and emotionally very secure, and so forth.

On the other hand, we really do have to have an understanding among childcare workers as to how important social development is in that window, sort of from about two to five, in particular, because you know people like Richard and Tremblay have shown, that's the window in which kids can unlearn physical aggression. The model is not one of kids learning it from tv, you know, when they're teenagers or something, but it's a question of unlearning physical aggression during a window of opportunity early on in life. And so, you know, having skills there to look for that, to look for kids who are overly anxious and to be thinking about how do you change the environment so that these kids can develop the best possible, you know, is very important. And that takes a lot of skill.

## Hertzman – key factors (2:41)

Developmental Health – 1.1 Life course trajectories

As I said, the importance of the early years is that it influences the rest of the life and so by the second decade of life, we see that children who have not had a good start are at an increased risk of school failure, of becoming pregnant early on in life, and of getting involved with problems with the law and criminal justice. By the third and the fourth decade of life, they are at more risk for obesity, for elevated blood pressure, and for depression which is a huge problem throughout the world. By the fifth and sixth decades of life, they are at increased risk for heart disease and for diabetes and then late in life they are at increased risk for premature aging and memory loss. We know this because children have been followed from birth right across the life course, so this is not rhetoric, this is about real measurement of how the early years influences health and well-being as well as learning and behavior across the entire life course.

So then, that raises a very important question. What actually are the key factors that influence early child development? Now many of us get caught up in empty discussions about this. Sort of is it family or is it society? And the key word there is "or" that somehow or another it's gotta be one or the other.

This little graphic with the ducks shows you what's the problem with that kind of thinking. Here we have a mother duck with her babies following her along, doing what a mother duck is supposed to do. But in this second panel here, you notice that she encounters a social condition that is beyond her control and she has to navigate her babies through that social condition. And what happens? Well you can see at the end, only one survives. So, is it family or is it society. Is she to blame or is society to blame? And clearly the answer here is, that we have to have a partnership between family and society, exactly the way we have committed ourselves to in the convention of the rights of the child. So that families want to do the best for their children but they need support from society at all levels and I'd like to talk more about that.

Because the answer to the question is really this. That early child development depends upon the experiences that children have. Like we've talked about before, the human faces up close, the language, the opportunities to develop socially and emotionally and that those experiences occur in the environments where they live, learn and grow up.

## Hertzman – population health (2:16)

Developmental health - 1 The developmental health perspective

Well, population health is the study of why some groups of people in society, in regions, etc., etc., are healthier than others. And so in a society like Canada, one could ask, you know, why are non-aboriginal people healthier than Aboriginal people? Or why are people, as you go up the socio-economic spectrum, increasingly healthier than those as you go down the socio-economic spectrum.

It turns out when you actually delve into the question of population health that a lot of the factors that determine whether or not people live healthy lives as well as have a high sense of well-being and competence, really emerge from the early years of life. That's one of the things that's come out of our study of population health. In particular, early language and cognitive development, early social and emotional development and early physical development all contribute to health across the life course. And so people who are interested in early child development need to understand that what they're doing can have a life-long impact on health.

I think there's good reasons to believe that what goes on very, very early on does have a long-lasting effect. Now, one has to be very careful when one says that because some people think that means you're saying it's all over by age X. And it's difficult to get people to understand certain kinds of population context. What we're really saying is if you take 1000 children who are not doing well on one or more of their domains of development by the time they reach school; you take another 1000 who are doing well; and then you watch to see where they are 10 years, 20 years from now. On average, what you will see is the 1000 who are doing well will be doing better than the 1000 who weren't. However, within each of those groups there will be huge variations. There will be kids who are doing great going into school who are doing terribly 10 and 20 years later. More importantly, there are kids who will not have been doing very well who will be doing great 10 or 20 years later. Right. But on average, those are the differences that you will see, right. And so it is difficult to get people to understand how to think in these population terms and understand what we're saying.

## Hertzman – social gradients in early child development (4:14)

Developmental health - 2.2 The gradient effect

So the then question comes. What happens if children do not have equal access to nurturance at each of these different levels from the individual right through to the global environment? And there's a very simple answer to that. And the answer is: That we get inequitable outcomes in terms of child development. What we call a social gradient in early child development. And this little graphic here shows the key domains of early development that matter early on and matter across the life course so it represents physical health and well-being which matters early and across the life course. Communication skills, whether you understand and make yourself understood. Language and cognitive development – your thinking and reasoning skills and so forth. Emotional maturity – your ability to negotiate in difficult situations, your empathy, your helpfulness, etcetera, etcetera. Social competence – your ability to concentrate on tasks, work effectively in groups as opposed to being disruptive in one way or another. And all of these things are affected by the early years.

And so what happens is, in most societies around the planet is, that the opportunities for developing across these domains differ greatly from one child to the next according to where they stand on that multi-layered set of social determinants and so by the time children reach school age what happens is we get inequities in their development and at the privileged end of society, the children of the best educated, wealthiest, and most privileged people in society, they tend, not always, but on average to get better opportunities to develop and at other ends of the spectrum among the poorest, the least educated and the least privileged families they tend to get the least opportunities to develop. And what we see when you go from the top end of the social scale in a society to the bottom end of the social scale that the fraction of children who are behind where we would like them to be on their development goes up in a step-wise, gradual fashion.  So the most privileged, the fraction of vulnerable kids is slightly less than it is among the upper middle-class than it is among the middle of the middle class than it is among the poor than it is among the desperately poor. And we see this right across the world.

And so to illustrate with that, with three examples. Here is the example of Canada - one of the world's wealthiest countries. And if you look from most well off quarter of the population, about 14% of children are behind where we would like them to be by the time they reach school age in their physical, in their social-emotional, or their language and communication skills. For the next middle class group, about 23% are behind where we'd like them to be and then for the poor and the very poor it goes up over 30%, so you can see that as we go down the socioeconomic spectrum, the fraction of vulnerable children gradually goes up. Similarly, if we look at a middle-income country like Jamaica, it goes from a low of 19% among the most privileged, gradually up to reaching over 45% at the low end of the socioeconomic spectrum. And similarly in a poor, and war-torn area like Kosovo, the low of 30% among the most privileged people gradually going up into the 40-plus percent up to over 55% of the children are behind where we'd like them to be on their development by the time we reach school age.

And what this shows is, an unequivocal objective for us which is that what we want to do is try to reduce these gradients in a positive direction because once these gradients, or this gradual increase in the fraction of vulnerability from the most to the least-privileged people in society, once that establishes itself it tends to track forward over time and influence children's life chances and influence society's ability to be able to produce healthy, competent adults to support the future.

## Hertzman – what parents want (1:02)

Ecology of childhood - 1.1 Contexts

Basically, parents and families want what's best for their kids but they do need help at all levels - at the level of the local community and at the level of the broader society, in the form of a variety of things, including policies that support work-life home-life balance, that support basic income and that support housing and neighbourhood development that make sense. But also in terms of unrestricted access in terms of no financial barriers, no geographic barriers, no cultural identity barriers to high quality prenatal developmental identification, primary care kinds of things - seamless transition into opportunities for early child development and parenting and for quality child care. And those issues are emerging the same way in resource-poor countries as they are in our society.

## Heymann - benefits of universal access (1:14)

Developmental Health - 3.2 Shaping public policy

The experience in most countries is that universal programs have more success, not only in reaching everyone, but in reaching the most vulnerable. And the reason for that is fairly simple. When programs are targeted only at a few, they're easy to cut from government budgets, they're easy to do poorly; there aren't enough people to advocate for them.

So when we've created, for example, successful primary school or secondary school as societies around the world, none of our countries have said we're only going to create primary school or secondary school for a small number of children. We've said it needs to be for everyone. We have to do the same for 0-5.
Likewise on healthcare, overwhelmingly what all of our countries have done is said healthcare should be available to all, not that we should provide it to 5% or 10%. And we need to do the same for health and nutrition to our youngest children.

## Janmohamed – recommendations (1:53)

Ecology of childhood - 2.1 Families

There are three things that are coming up, one is that in the same way that we're, are comfortable talking about the development of language or social-/emotional development, we need to embed, in course content, gender development and sexuality, and I think that that comes from the perspective of children's development, as a way for educators to understand that it's very much a part of our being.
The second thing that I think that's important is that, in the material that we actually use in class, with the students, we need to be able to embed content that relates to gender identity, sexual identity, so that people are comfortable, and start to understand that families come in all sorts of shapes and sizes, and they come just slightly more different than we thought that they would be.

And then the third thing, I think in practice, where, there is still a fair amount of 'heteronormative' practice in early childhood programs, things like, saying to a little girl, "You look so pretty today, oh look, your boyfriend is here," and that's completely unnecessary with, you know, three and four year old children, but it's actually very much the case, or we don't know how to encourage girl children to engage in the block area, we don't know how to encourage boy children to move to the drama center, and then sometimes when we do come across those boy children who like to be in the drama center, and want to be a princess all the time, we're unsure about how to react, if to react at all, and I think that in the practice situations that those are possibilities of case studies that we can talk about, that would help inform the Early ChildhoodPractitioner

## Janmohamed – same-sex families in ECE material (2:36)

Ecology of childhood - 2.1 Families

In my research study, I did three things.  I looked at textbooks, course outlines, course readings, around how families were discussed in early childhood education.  I also interviewed parents, and I did a random sampling of parents across Ontario, and I got a good sample from people in rural and northern Ontario, and, the other thing I did was, I did interviews and focus groups with Early Childhood Educators, I've done three different modes of data collection around this particular research question, around what is the experience.

Primarily the textbooks, I would say, that there's a dominance of silence around this particular family construct. What I came to learn was, in many of the foundational textbooks that I looked at, and I looked at them, at four colleges in the Ontario system, based on where the parents contacted me from, and in those college programs, there was only one that actually offered a course around what they called "anti-bias curriculum".  But when I dug deeper, even within that course content, there was very little content in terms of same-sex parents.  So, we are fairly well versed around talking about diversity, in terms of talking about immigrant status and second language issues, but not in terms of this slightly more difficult topic, I think, in terms of sexuality and sexual orientation, but the reality is that there are more and more parents who identify from the queer community that are having children in all kinds of combinations and permutations, and I think that that silence needs to be opened up, to have a conversation, so that when we exit Early Childhood Graduates, they're just as comfortable working with children that come from families that are somewhat different from their own

And in fact, what I found was that, in the smaller communities they were more comfortable asking questions than they were in the urban programs. The other thing I found was that in several examples, it was the first conversation those educators had ever had about the sexual orientation of parents, or, you know, the gender identity of children, and how that develops.

**Janmohamed – studying early childhood educators (1:03)**

Ecology of childhood - 2.1 Families

One of the important things that has come from the, my research around diversity and inclusion is that when we think about that concept in Early Childhood, it includes a lot of different types of identities like immigrant status, English as a second language, sometimes lone parent families, but rarely does the difference around family construct come up.

So, in my particular area of research, I started out looking at same-sex parents and their kids in early childhood. What I came to learn is that it goes far beyond just same-sex couples.  It can also include people who are bisexual, there are more 'trans' people having children, and I think that in Early Childhood training, we have a responsibility around understanding the differences in different families in Canada, and also about how our own Early Childhood practice may be impacted on all families, including those kinds of families.

**Janmohamed – support to same-sex families (0:56)**
Ecology of childhood - 3.1 Sustaining home life

The one area that comes to mind is, in terms of the demographic shift, that I think it's important for those of us in Early Childhood to understand is that after the Pediatrician's visit, often Early Childhood Education programs are the next place that parents come into, and it's really important for us to be attuned to the fact that we can play a really significant role in supporting the family unit, particularly around the families that do identify as queer, or same-sex, because often those families may not have the support or the backing of their own biological families, and so the extended Early Childhood community can often provide the kinds of supports that, in a normal situation, quote unquote, extended families support.

## Janus – children are forgiving (1:04)

Brain development - 3.3 Caring through everyday experiences

Well, children absorb everything that's around them when they grow up. So they absorb good things and bad things. But what I mean that they're forgiving is that the little things that perhaps are not so good will be very clearly, very quickly superseded by things that we do, like cuddling, and loving and nurturing, and being the best parents we can be. Or caregivers or friends or whoever we are. So this is basically to convey the message that why it's very important to be very aware of what's happening around young children, even older children as well, but not to try to kind of beat yourself up and think "Okay, well I yelled at my child once or twice" or "that obviously that's going to make a horrible impact on their future life". We're all human. So as long as children understand that we are just as human as they are and we, and they always know that we love them, I think that's, it's going to be okay later on.

## Jenkins – supporting families (3:22)

Ecology of Childhood – 2.1 Families

We need to do a much better job of supporting those families than we do now. I think that would make children's direct experience and learning within that family better.

We are able to recognize the children than are going to be hard for their parents to parent, they're the kinds of vulnerabilities that we now know about. They're behavioural vulnerabilities where they're tough kids, they're easy to anger, they're difficult to deal with. So we know that. We know about these kids who have language problems. So, it's harder for them to learn language, to learn those skills of communication, and so they're harder to parent. We know from the genetic literature, and we've been finding this as well, that kids with particular polymorphisms are more vulnerable to adverse environmental influences like this disadvantage that I'm talking about, or like the parents being angry and irritable within the family context or the parents not being sensitive to the kids. Certain kids will respond to that more negatively than other kids will and those vulnerabilities are both behavioural and underneath that behavioural element are probably a whole series of things. There are genetic vulnerabilities; there are also how the children have developed in utero.

We know that kids who are very low birth weight are more neuro-developmentally vulnerable to those psychosocial adversities that I study. And so, through all of that we can really say this child's going to need help, and we can do that pretty early on. I think we should be doing that much earlier than we are doing it, and really supporting parents, because as soon as they've got difficult kids, kids who are learning more slowly or who don't have the language or who are much more difficult and irritable to handle then the parenting becomes more of a problem because the parents are, it's so hard to handle that kid, so we should right in those early early ages, we should be putting those supports in for families and I think those supports are two kinds. I think they're one kind of support is child care and is early schooling for kids, and I think as a society that's something we should be thinking about. I think the other kind of support is really intervention for parents, to help those parents understand what those kids are going through. To help them get inside the minds of the children and be able to, through that understanding, to support the kids more effectively so that you don't set up these patterns of real troubled relationships between parents and kids because we know that those troubled relationships are what predict over the whole life course how children manage in their life, do you see…too early?

## Jones – epigenetics (1:03)

Brain development - 1.1 Brain architecture

So the word epigenetics actually means on top of genetics. And so what we mean when we talk about epigenetics is the sum of the modifications to DNA that don't change the sequence of DNA itself but that change the way the DNA is used. So you can think about it like light bulbs.

If you imagine that all of the genes in your genome are light bulbs, then the genetic sequence determines what shape the light bulb is going to be or what colour it's going to be. But the epigenome is like a dimmer switch on those light bulbs. It changes how bright that light bulb shines.

So we know that people's genes affect their health, they affect their personality, they affect their lifestyle. We also know that the environment affect those things almost as much. And so the epigenome is a wonderful way of finding real evidence, biological evidence that those things interact together to influence our lives and our health and our personalities and what we do.

## Kaiser – button pushers (2:44)

Coping & competence  - 3.1 Understanding feelings and behaviour

A button-pusher is when a teacher feels that a child's behaviour is just making them feel like they want to explode because they are just – it touches something that they haven't dealt with yet.  It's the behaviour that they are almost afraid of and when they do respond to it they usually respond in an out of control manner because it was something-sometimes it's an unexpected behaviour but more often it's a behaviour that they just don't know how to deal with it, like running away.  What do you do?  If you run after them then you're playing the game. If you don't run after them when the parents come to pick them up at the end of the day and you say "Well, at 10:00 he was in the block area but I don't know where he is now," you run in to a bit of a problem.  So for me, that's a button-pusher because I'm just not sure how to respond to it in a way that will support the child.

Well what research has shown is that when our buttons do get pushed we have something called an amygdala hijack. And when that happens, our cortisol level really rises.  Our blood pressure goes way up.  And what the research has also shown is that it takes about six seconds; it takes about six seconds for your brain to reorganize itself.  So when you feel that you're starting to see red and oh, I can't believe she did that, if you take a deep breath and one way to kind of get the rest of your brain, the thinking part of your brain to function is to maybe create a math problem where you need to have your frontal lobe active, in order.  So even just something in your mind as 5+3=8 will encourage your mental process to change.

And what I suggest to teachers often is that when the children are out of control, they're often experiencing their own mini-amygdala hijack so that if you actually share with the children-"this behaviour is making me really angry; I'm going to take a deep breath and I'm going to count to five or I'm going to, you know, 5+3"..or whatever you would say out loud, you're role-modeling a strategy as to how they can deal with when they're having that behaviour as well. I think our biggest job is that of a role model and so if we can demonstrate the importance of self-regulation they begin to see that they can achieve it as well.  If we lose it then we're role-modeling behaviour that we don't want them to engage in.

## Kaiser – innate rights (1:59)

Coping & competence - 3.1 Understanding feelings and behaviour

I think that what we have to recognize is that every child is special, every child has a gift, every child brings something with them. And when there is inappropriate or challenging behaviour, we often lose track of that and our response is punitive. And punishment doesn't teach children anything.

So when we look at the rights of a child, I think the child has the right to grow up to be the best person he can possibly be and that the adults in his world's job is to ensure that that happens. So if we respond to inappropriate behaviour in a punitive negative way, we are in no way supporting that child. So what we need to do is we need to learn the skills required to understand why that child is behaving that way and provide the support and guidance and teach them the skills they need because there's a reason for that behaviour. And if we know the reason for the behaviour, we can teach them better ways to meet those needs.

And what I say to educators when I do my workshops, is if I ask them what behaviours they find challenging. And then I say to them, if you know, if they say for example… he has, if you add the three words he or she has difficulty controlling his emotions, he or she has difficulty joining in groups, he or she has difficulty … whatever it might be, and those three words imply that your job isn't to punish but if a child has difficulty your job is to teach. So I try and guide educators in that directiodn and not necessarily thinking so much about the UN Rights of the Child so much as the innate rights of the child that the UN recognized.

### Katz – insight into behavior (2:15)

Coping & competence - 3.2 Getting along with others

For example, a child who's very shy, it's not much use to say "Why don't you go over there and play with them?" it doesn't work very well, but you could say to that child, "If you want to go over and play with those others, I can help you, just let me know."  So the child takes initiative, and that's an important part of early social development, which kind of reminds me, on one occasion I was working at a, in a lab school in a different country, and in the mornings the teacher of the four year old class would go around at ten thirty with a tray with crackers to give to the children, now, nothing unusual about that.  This happened to be in February so the children had been in that, four year old children had been in that group since September.

But there was one little girl in the group who had never, ever spoken in school.  All the evidence was she spoke perfectly normally at home, and in the neighbourhood, and with her cousins and her brothers and sisters, but in school, not a word.  And I was watching the teacher and she would go around offering the children, with the tray, offering them a cracker, and when she got to that little girl she said, "You can't have a cracker unless you use your words."  And what did the girl do?  Walked away.  And so I talked to the teacher and I said "You know, try this, see if this helps, say to her, 'You don't have to talk if you don't want to, but if you change your mind, I'll be over there'".  And within a week she was talking.  Now, I've often wondered about this, how, is that, why didn't that teacher think of that?  And it's what we call insight.  It's not technical; it's not a technique to use.  It's an understanding of what might be causing the behavior which in her case is she dug in her heels no matter what, she was probably a very stubborn kid, and once she dug in her heels, she wasn't going to un-dig them for somebody, by somebody else's command, she was going to do it when she thought.  And it worked fine, and in many situations like that.

## Katz – intellectual content in Reggio programs (2:48)

Communicating & learning - 3.3 Creating curriculum

I was, as usual, visiting schools and working with teachers, and I would begin to ask the question, "When I observe teachers interacting with children, what is the content?" and I was amazed how much of it was what we call 'housekeeping'. "Don't forget to hang up your jacket, it's time to come and wash your hands, stand in line over by the door before we go outside, you, where's your lunchbox?" All of this kind of housekeeping, but there was no real intellectual content. About what you're planning to do next, and how far did you get, and do you need any help with this, and so on, and I, I saw a lot of that really good content in Reggio Emilia, which some of you might be familiar with, these wonderful pre-schools in a small town in northern Italy where they, what they do is quite remarkable, and there are many things that are remarkable about it, but one of them is there's lots of rich content because the children are making things and investigating things, and trying to figure out how to represent.

I watched a videotape there recently with four, four year old boys were together at a small table, and they were, they had decided, I don't know how they decided, or why, but they were going to make out of clay, a table. So they had a big clump of clay on the table, and they took pieces of it and were rolling it to make the legs for the table. So they'd roll it and say, "Oh this is a leg!" and by the way, constantly talking to each other through this. And stand it up, but it curled over, so they said, "Oh it's not standing. Maybe, maybe if I add more clay," and so there's a lot of talk, and another child would say, "I got it right, 'cause mine's thicker!" And so all this conversation, eventually they got the four legs, pretty thick legs. And then they took a big clump of clay together to make the tabletop, and they were rubbing it hard, and they argued, is it going to be round or square, should we do it this way or that way, a lot of talk, it's so important, there's something to talk about. They finally finished it, and they picked it up, and they put it on top of the legs and it collapsed. And they said, "too heavy, try it again." Now that's just a very quick picture of what happened, but they must have worked on it for, I would say, about forty minutes. A lot of talk, trying things, what didn't work, and this worked, and that didn't, so there's content for the relationship, that's real, not phony. So that's one of my concerns about what kind of content do the children's interactions have? You've got to have something interesting going on to make rich content.

## Katz – reading skill and disposition (1:39)

Communicating & learning - 2.2 Literacy

I often talk to teachers about the distinction between having a skill and having the disposition to use it, and the best example I can think of is that you want children to have the complicated skills of reading, but you want at the same time, that they have the disposition to be readers. It is possible to find learning to read, especially in the English language, which is one of the worst, so painful that you'll never read when you leave the school building. In which case you've got the skills but not the disposition, but of course it wouldn't be much use to have the disposition to be a reader if you haven't got the skills.

So the important thing for us, as teachers, is to say, to ask ourselves, "How do I help children so that they acquire both together." the skills and the disposition to use them, and by the way there is some evidence that children who are around adults that they see reading frequently, doesn't matter what they read, the point is young children who are around people whom they observe reading tend to learn to read more quickly or more easily, or with more enthusiasm, shall we say.

So the question is how do we help children to acquire the skills and, at the same time, the disposition to use them, and that's true of all skills, it's having the disposition to use them. And a lot of that depends on whether they're reading something that's interesting, not necessarily something that's easy to read.

## Katz – representation with "graphic languages" (2:15)
Communicating & learning - 3.3 Creating curriculum

One of the other really powerful lessons from Reggio Emilia, is that the children, very early, do drawing.  If you ask a two and a half year old, you give a two and half year old a pencil and paper and say, "Why don't you draw whatever", they will try it, but if you wait 'til a child is five, most of them will say, "I can't draw."  You ask any adult, I ask you, or people around you to draw a building or the car, they'll say "I can't draw," but when they're very young, they don't know they can't draw.  Some draw better than others, that's always going to be true, but what they do, and I found it very helpful as a lesson, is they don't talk about art, they talk about representing.  What you're looking at, what you remember, what you're planning, and you represent it with what they call graphic languages, it can be pencil, it can be painting, it can be clay, it can be anything.

So this act of representation also involves looking.  And I've worked with teachers who've been trying this and it's so interesting they say, the children say, "Yeah I'm drawing this, but, what's that bit? What is it called?  Why is it there?  Who made it? Where did it come from?"  That's what you want, that's the intellectual content of the interaction between the children, and between the children and the adults in the classroom.

And so my point was that the children are engaged extensively in examining, studying, asking questions about things that are going on around them, that are real.  And using what they call the graphic languages, drawing, painting, and various other sort of languages to record their observations.  They certainly argued with each other about what they'd seen, or what they'd done. They, there's one, I have some pictures of a big mural the kids made of small drawings of bird feathers.  They'd gone to a local museum and they'd shown the kids how, what, bird feathers are very complex, I'd never thought about it, but they have all kinds of shapes and sizes, but that's, you know, one of my main, sort of causes, is get the children involved in examining, closely, things in their environment.  When they get older, they should examine other peoples' environments.  Historically way back, geographically far away, but the young ones, there's so much to see in their environment.

## Katz – self definitions (2:23)

Coping & competence - 1 Coping and competence in early childhood

Interesting research, a large body of research now suggests that unless children achieve at least a minimal level of social competence by roughly about the age of six, they will be at risk for the rest of their lives.  Because, not because they can't, just can't learn, but because once a child has experienced being defined as unlikeable or has been avoided by peers, then that child tends to define itself as unlikeable, and we've got plenty of evidence that children will bring their behavior into line with their definition.

Like sometimes the child is defined as the class clown, well this child from the studies we have, would rather die than not be funny, because that's his identity or her identity, and that's the same with the child who's unlikeable, and that, generally speaking, that child's avoided, and what we do have reason to believe now is that when those children like that are teenagers, they find each other.  And they solve the problem of being unlikeable by joining together with the shared bitterness for the rest of society.  So they have the experience of closeness based on shared bitterness, and they would rather be, make trouble than solve their problems, because if they solve their problems they won't have the shared bitterness so they'd lose the closeness, so getting the social development right in the first six years is hugely important, and by the way, we know a lot about how to do that, and I've spent a lot of my time with teachers helping them to help different kinds of children with these problems.  But most children we say, for the sake of the discussion, all children who see themselves, by the time they're about six, as unlikeable, have to be helped by an adult.  They cannot solve the problem by themselves.  But we do know how to help them.

**Keating – biology (2:08)**

Developmental health - 3.1 Advocating for early child development

And we've already talked about some of them. So one of them I think is really getting people to have less fear about Biology. The reality is that we are biological creatures, we have an evolutionary history, we come from an animal kingdom, so we are members of that animal kingdom and that creates certain opportunities and it also creates certain constraints. And so, one of the things that I think it interesting when one, as I've had the opportunity to talk about with social scientists and talk about with social policy people in a variety of things, they get very anxious and nervous sometimes when you start talking about Biology, but I think it's fundamental to understand and I certainly would hope that practitioners would understand this as well.

It has to do with what it is that's having an impact and why is it having such a durable impact? It has an impact because in fact as I've said what we're doing is building brains with these experiences; directly through the neural circuitry, indirectly through the epigenetic regulation of genetic processes. And so, we are fundamentally impacting on the biology and the social policy the practitioners experience has to understand that we're laying down important tracks here that are going to have a long lifespan. Again, not a fixed one, not one that cannot be altered by an experience, but it gets harder and harder to alter some of the things if the wrong circuits, if the wrong things happen early on, and recognizing when things may be going off the rails not because anything wrong has happened in the child's environment but that they have some anomaly that needs to be dealt with, right.

So, for both normally developing children and children who are challenged in a variety of ways, figuring out and understanding that we are in fact in the business of building brains when we're in that early child environment when we are parenting children, that is what we are doing, and we have to accept the fact that that's an important responsibility that we have. So that's one lesson I think that science can have.

## Keating – parenting (1:28)

Coping & competence - 2.2 Family relationships

One of the most rigorous and replicated findings in all of developmental psychology is that parental effects do matter and they matter to a very substantial degree and that standard findings have been replicated also within that literature that essentially it's a combination of warmth and responsiveness of the parental figures in the early years particularly mother who's typically the primary caretaker. When the mother is the primary caretaker it's that warmth and responsiveness. Whoever the primary caretaker is that's an important thing, and by warmth it's obviously means kind of general acceptance, a sense of love and affection, emotionally communicated affection as well as responsiveness to needs as they arise, so responsiveness that's time sensitive; the younger the child, the more time sensitive those responsiveness needs are. So there's a warmth responsiveness dimension, higher being better, but then there's also a dimension that is in the area of expectations or demands; the sorts of things where parents place limits on their children that children get to understand that there are limits, because for many children, for most children, the absence of limits is a terrifying thing, so needing to have the structure of where the edges are in their behaviour, where the edges are in relationships, where the edges are in things that they do, is an equally important component to their felt security and to their ability to learn to function, to explore and to be comfortable in the world.

## Kershaw – nurturing environments (2:54)

Ecology of childhood - 3.3 Creating child-friendly communities

Well we know that the early years are critical for predicting a range of things later on in the life course. And we know that early nurturing environments, including community environments, are critical for influencing early development. So for instance, we know that the early nurturing environments, by one's second decade, are going to influence school achievement, without a doubt, and interaction with the criminal-justice system. As we move into our third and fourth decades, it gets at levels of health issues around obesity, diabetes, and things like mental illness and depression. And as you move on toward later in the life course you will see that the early years still are very predictive of later health and well-being.

A nurturing community doesn't think that we eliminate child poverty or child vulnerability by only putting up pictures of children and focusing on what children are doing. A nurturing community recognizes that children grow up with adults. And so supporting adults is just as important as supporting children. In fact you support children often by supporting adults. So a nurturing community is one that provides time, for parents to fulfill their responsibilities as parents, and their aspirations to care personally. I mean one of the challenges that we're running into is that sometimes people are putting more time into the labour market and we worry that that's at the risk of having the time, but if we ask them to take more time, then we're having people who are poor. And there's no doubt that the income poverty is a major predictor. So we need to recognize how to put in place income supports and rely on the labour market to provide people with wages that are sufficient for them to tend to the income needs of their families.

We have started to adopt rhetorically, this notion that it takes a village to raise a child. It's a really lovely African proverb. But we don't live it. And we certainly have in place a system that, even if you are rich in Canada, you're going to find it hard to access services before your kid is aged six that you think are important. Child care services are an example. But even if your child is identified say with an extra support need, try and find some support services to address that issue. Or issues at pre-k or some of the monthly interaction with professionals who could help you recognize what are the important developmental stages from month to month to month. We could do that. That would be nurturing. But we're not yet doing it because we have a vision that there's something magical about age six. I'm not sure what's magical about age six, but I know then as a community we become more nurturing because we'll create schools and invite everyone to come there. And we don't call them institutions that are robbing our families of time with their kids. We think "no, okay that's an important place where society can kick in". And, we'll put in place health care, although disproportionally as, you know, people get older. So those are things that make a society nurturing.

## Kershaw - recommendations (2:28)

Ecology of childhood - 3.3 Creating child-friendly communities

We need to have a pan-Canadian system of early learning and care that kicks in at about 18 months, for all families that want or need to use it. It's not mandatory but that's where we need to create that as a viable option that recognizes two things: it supports parents to be in the labour market—and we expect people to be there to earn their income and support their families—and ensures kids get quality nurturing environments while their parents are doing that work.

On the time side, parental leave is critical. Parental leave is a period that recognizes those first months where, you know, parents and children have so many new adaptive needs not something we have a lot of time to enjoy. And breastfeeding's going to be a big deal. And carving out time for fathers, not just to be family helpers, but to be engaged and primary caregivers. That means we need to carve out time for people to do that. And raising the parental leave system eligibility from about 12 months to 18 months, per birth, reserving the last six months primarily for dads, is critical and that's going to cost us in the order of about four-and-a-half billion dollars more.

We'd also have to recognize Canada has intolerable levels of family poverty and by international standards we're going to, we really are doing something that I don't think Canadians recognize. But other countries have all but eliminated it and we tolerate it at really high levels still. And so we need to spend in the order of about six-and-a-half billion dollars to make our welfare system more generous, and also to play with our tax system to make work pay, and/or have employers make work pay by having higher minimum wages.

There's one thing we already do relatively well in Canada. Because we have invested in our health care system—and this is something we take such pride in. And so, after children are born, on a month-to-month basis, we need to get the health care system, and all the health care professionals organized in the health care system, to interact better with family resource programs—things we call in British Columbia like Strong Starts, you have analogues to that all over the province—a range of other non-medicalized professionals, and then collaborate and coordinate, so on a monthly basis interact with families with young kids, and start to help them monitor and screen when their children might be having developmental delays and pick that up way before they get to school, 'cause that's when it will be inexpensive to deal with, and then we can—or less expensive at least—and then we can support their families so that when they get to school, hopefully children will have caught up and if they haven't we'll be better ready to have them more seamlessly enter the school system where they can continue to thrive at their level as best as possible.

## Kidder – family centred care and the hug hold (2:27)

Coping & competence - 1.2 Individual differences

When we talk about family centered care, we utilize that approach in a lot of different ways. One of the situations is how do we use family centered care when a child is going to experience a procedure like having a needle, like having an IV. start, like having electrodes applied to their chest, and a blood pressure cuff, and an occimeter for sedation, for a medical procedure. What we've learned is, the most important person that's going to help that child cope it their caregiver, the most trusted person. It could be a mother, it could be a father, it could be a grandparent it could be a foster parent. Whoever is the most significant adult with that child you want to maintain that relationship so if we keep them together, they're both going to cope more effectively.

So for example having an intravenous start, we could have the child sitting on the adult's lap that could be enough. But if it's a young child there's still going to be arms moving, legs maybe moving. A child who is 3 is losing a sense of control. The last thing they want is to be restrained for a needle. The most we can do to help them psychologically and emotionally is to hug them, and we've discovered that if a child straddles his or her legs around the parent and the parent hugs that child, the nurse has access to the child's arm while the parent is gently giving the child a hug, is helping the child as opposed to being restrained, and we really need to be mindful of that when we're working with children. Children do not like being restrained. They do not like losing their sense of control. Any time we can avoid that, we're doing good work. If we restrain, we may be causing harm.

## Kolb – play learning (2:39)

Communicating & learning - 1.2 Thinking and learning

I would say the more different kinds of learning experiences you can have, one of which is play based, the better off your brain development's going to be and the better off you're going to be in the end.

I think the schools need to pay attention to the fact that play is necessary. I know there are schools that are going away from recess, going away from play periods because of perhaps litigation issues or worries about children being injured and so on, but what they're doing is they're changing brain development by not allowing kids to engage in these kinds of play. Furthermore, the attention span of kids, especially boys, in the absence of having engaged in play is clearly reduced. Perhaps less so in girls, but nonetheless I think it's equally important that they've got to engage in play behaviours. Certainly when I was a child a very long time ago, going to school, we played at recess. There was a soccer ball and all the boys chased it around the field when it wasn't snowing. Then when it was snowing you did other things, running around the field. That was important. If you can't do that sort of thing and you're supposed to sit and be quiet, that's not engaging the brain in any way, it's turning the brain right off. I think if play has a function, and I've suggested that it does, you've got to recognize and respect that function and say okay, how can we enhance this, how can we do it in a way that we don't have children getting injured, although I don't recall anybody getting injured on the playground when I was there, but perhaps some were.

I have this worry that what parents have done and what schools have done is they've overprotected kids to the point that they're interfering with normal cognitive and brain development because they're not allowing the kids to do the things the brain evolved to do a hundred thousand years ago. It's a sudden shift that may not be all that good. That's my gut feeling.

Given the developmental changes that are going on in the brain and particularly in the frontal lobe, both during the infant period and then the pre-adolescent and adolescent periods, the importance of play, and normal play if you like, peer related play really comes to the forefront. This is going to have huge impact on frontal lobe development and the ability to do the kinds of executive functions that the frontal lobe is engaged in. Now, I focused on the frontal lobe because that's where we see the changes most easily. Is it the only place, probably not, but it's one where they jump out and smack you in the nose and you go wow, those are big changes.

## Kolb – social interaction (2:01)

Coping & competence - 1 Coping and competence in early childhood

So the question we can ask is do kids have to play with other children or can they just play with puzzles? They're both kinds of problem solving, and I think they're both important kinds of problem solving. The studies of Tom Boyce suggest that the interaction of children and the way they engage in play-related behaviours is very important. That playing with puzzles or doing word games or whatever may be important for certain kinds of activities, but children set up social hierarchies when they play with one another, and these hierarchies are important in children learning how to engage with one another. If you think about the most complicated behaviour that we have, it's social interaction because, just give you a simple example, if I'm around my mother, if I'm a child for example, I'm around my mother or I'm around my friends, I do not behave the same way. If I'm around my mother versus some other adult I don't know, I don't behave the same way. If I'm around my conspecifics, my peer group, and it's made up of six individuals, and then another time it's made up of another six individuals but they might have an overlap of two, my behaviour might be very different in the two situations. Just watch teenage girls, I mean the way they interact with one another with one group of girls versus another is completely different depending on their experiences earlier. Males aren't so affected by those early interactions. So I think that those actual one to one interactions rather than one to puzzle interactions are really important for getting the frontal lobe up to speed in terms of how you keep track of all of this contextual information that you're going to need as an adult in a complicated world.

Does that mean that puzzles aren't important? No, it doesn't mean that at all. It just means that the social interaction is a really complicated form of problem solving. You need to do it to learn it, you can't be told how to do it.

**Lee – cultural norms and socialization (1:47)**

Communicating & learning - 1 Communicating and learning in early childhood

In Chinese culture when you interact with each other, you're not supposed to look in to people's eyes.  But in North American culture, you have to do that otherwise you be considered impolite and et cetera but in China, it's the other way around.  So what we have found is, at about three or six months of age, babies are not that different when they're looking at their own race and other race faces.  So they're typically looking at the eyes because eyes are very, very attractive to all the babies all over the world.  But by about 10 months of age, Chinese babies start to avoid looking at own race, Chinese people's eyes.  They start looking at the nose and Caucasian babies continue to look at the eyes.  And then with age that doesn't change.  So Chinese individuals, children, pre-school children, school-age children, adults, they'll be looking at the nose of the own race face but when we show them other race faces such as Caucasian faces, they are not afraid, they look at the eyes.  So our culture actually shapes the way you look for, where you look in the face to make sure you comply with the norms of your society.  And the surprising part is it starts that early, you know, about nine months of age they already learned about how to do it in a Chinese way, I'm talking about the Chinese babies.  I'm sure the Caucasian babies in North America or most of the babies in North America probably are learning the norms of our society here and then they will be paying more attention to the eyes than the nose.

## LeFevre - learning to count (1:20)

Communicating & learning – 2.3 Early mathematics

One of the most important things that children learn roughly between about 2 and 4 is how to count. And we can think about counting in two ways. We can think about verbal counting or what's sometimes called rote counting. And that's just learning the string, the verbal string of numbers starting at 1 and going up as high as possible. And it's not just about memorizing those, although, that's what they do first. I'm sure we've all heard young children go "1, 2, 3, 4, 5, 6, 7, 8" and they don't really break it down into words. But eventually, they start counting in a more deliberate way. So verbal counting is one aspect of counting that's important. But children also have to learn how to count objects.

And so if I show you a group of four toys and say to you, "How many toys are there?", you need to learn a process for determining how many. Pointing to each toy, saying the verbal label, which is why you need to know what the count sequence is. And then understanding that when you've pointed to all of them and said a word, that the last word that you say is the quantity of the set. And that's referred to as cardinality. So, both cardinality knowledge and verbal counting are often referred to as counting but they're actually two quite different separate kinds of knowledge that children need to learn.

**LeFevre - numeracy and mapping (2:23)**
Communicating & learning – 2.3 Early mathematics

I would say that the next level of early numeracy knowledge in particular that children need to acquire is the knowledge of how quantities, once they know how to determine those quantities through counting, how those map onto written symbols. So, if we think about the three kinds of representations that you can have of a number: the quantity, the verbal number word and the written symbol- learning the links between those we usually refer to as mapping. So children need to learn the mappings among those three representations.

In research that we've done, children as young as 2 and 3 years of age, a lot of them know how to name the symbols. So if you show them a 4, they'd be able to say 4 and they can say the count sequence up to 10 pretty easily. They may or may not know how to actually count the set of objects. So that's kind of the difficult part.

So between about 3 and 5, they're mastering that counting objects part of it with the goal eventually of being able to look at a written symbol and know how many that that symbol stands for without having to have five things in front of them. They know that the symbol 5, what it stands for.

So being able to map across those three different representations kind of forms the foundation for a lot of additional kinds of knowledge that children have to acquire. They have to understand for example, that six things is more than four things. They could do that if you show them six things and four things by counting them at one point, you know by probably 5, most children would be able to do that. But you also want them to be able to look at the digit 6 and the digit 4 and know that the digit 6 represents more objects than the digit 4 does.

So it's kind of- the research that we've been doing suggest that that process of moving from external concrete objects to understanding the verbal symbols and being able to map them between words and written symbols and then being able to work with those symbols as if you had the objects in front of you kind of from 2 to 6, those are the critical early mathematical processes that children have to acquire.

**Levine- experience-based brain development (0:41)**

Brain development - 1.2 Experience-based brain development

It means pretty much what it sounds like. That the brain develops in a context, and the context is the experience that surrounds the brain on a variety of levels. Experience can be what happens to a cell as it's moving into place to form connections with other cells. And it can also be a whole organism life experience that may be formed by the family environment or by the broader social environment by economic class and by a variety of other considerations.

## Marvin – circle of repair (9:08)

Coping & competence - 3.1 Understanding feelings and behaviour

Having a toddler can be a real challenge, and I think maybe the one that strikes me as being the biggest challenge for the largest number of parents, is what you might call a "toddler meltdown", or a temper tantrum, or, but meltdown is a better, I think a better term. And so often when, when a child has a meltdown, the kinds of advice that parents get from their pediatrician, from the child's preschool teacher or day care provider, from lots of different places, lots of professionals, the advice that parents get is, "Well, you need to manage that. You need to get him to stop that. And the way to do it is time him out."

A time-out is based on the idea of making the child go off by himself and sit there until he can calm himself down and then he can come back and rejoin the family, or rejoin the activity. Now if the child is doing this thing absolutely on purpose, then that's certainly appropriate. But we estimate that toddlers are doing this on purpose maybe only one time out of, one or two times out of 10. Maybe only 10 or 15 or 20% of the time. The vast majority of the time, the toddler is not doing this meltdown on purpose but rather there's something else that happens. What we realize is that meltdowns, most of the time, happen because a child, a toddler wants to do something, or he wants something, and he's being frustrated, maybe it's because he can't climb up that slide. Or maybe it's that he wants to play with his sister's toy, or play with something dangerous and the parents says, "No, no, you need to share", or "No, no, you're going to get hurt with that, you can't play with it." And so the child has a meltdown.

And what we know now, is that what's really going on there is again, this child is not very wise yet--he's only a little toddler—when he's frustrated, he has the same kind of feeling that all of us have. This feeling that kind of wells up in us and it's like "Awww" kind of feeling. Well as adults, we've learned how to manage that feeling. We've learned how to cope with that situation. The problem is, for the toddler, he's still a little, little kid and he hasn't developed a strategy yet for doing that.

And we have another graphic that we use that we call the "Circle of Repair". And on that circle of repair is the same circle with the hands represented by the parents, and in addition to that, over on the right hand side, there's this little kid with his arms up. And he's saying, "Mom, when I get difficult, when I get frustrated, demanding, upset, out of control, what's really going on, what's really going on is not that I'm trying to hurt you, or that I'm trying to be bad, or anything like that. What's really going on is, I'm having this feeling that is really uncomfortable for me, that I hate, that, that I don't know what to do with and that's the most important part. I'm having this feeling and I don't know what to do with it. And I need you."

And there are a number of steps that sort of become the parent's job in this situation and these steps need to be taken in this order. First of all, to understand, that your toddler's behaviour, this out of control, meltdown behaviour, actually means that he needs you to do a number of things and he needs you to do them in this order.

First of all, he needs you to take charge. He's out of control and when little kids are out of control, they need their parents to take charge. "Be bigger than me. Be stronger and wiser than me. Mom or dad, you need to take control first of all and get things under control."  Second thing is, don't take it personally. "Please don't take it personally mom. I'm not, this signal that I'm sending, is not a signal that says to you, 'I don't like you, I don't need you, I don't want you, I hate you'. Even if I say 'I hate you', I don't."

The third thing is try and help, "you need to try and figure out, mom, what's wrong here. What do I need as the toddler? What do I need and what do you need to do? What's going on with me? I'm too young to be able to figure it out." So that's your job. Is to figure out "What's going on with my child?" And the rule here is, we often tend to, to make an inference. We often tend to think, "Oh, this is what my kid is doing". And it's usually what we call a negative inference. "My kid is doing this to bug me. My kid is doing this because he's angry with me. He hates me. Some negative thing about me."

And the rule here is, be kind in the inference you make, be kind in the inference you make. Don't make a negative inference. For these 80% of the time, sometimes negative inference is going to be appropriate but probably only 20% of the time. "Eighty percent of the time you need to make a kind inference about what's going on about me." Once you've made that inference and figured out, then the job is, "Soothe me. Try to calm me down. In a kind way. Understanding I don't know what to do, I'm out of control and I need you to take me in and contain me and help me feel better and soothe me."

And then, the next thing is, "Stay with me until we both understand what's too much for me to understand all alone here. Stay with me with this." Now, if I'm three, four, five-years-old, then I'm already at the point where you can talk to me about it and we can have a conversation about this. Most of the time with toddlers though, language hasn't developed enough and so it's really a matter of, "Staying with me and holding me and giving me the message, 'It's okay, it's going to be okay, I'm working on figuring out what's going on inside you honey'".

And then finally when you've got that figured out, mom, then help me to do what I was trying to do, but do it differently. And help me learn how to contain myself, and help me learn how to manage those awful feelings that I've been having. And just by being with me and holding me, or holding my hand, or sitting next to me or something like that is going to help me learn how to contain them."

Now this comes back again, all the way back, to this notion of time-out. What this approach is is more like a "time-in". It's not really a time-out. It's more like a time-in. "My child is out of control, he's hurting. He's having a feeling that's really uncomfortable and he doesn't know how to deal with it. So my reaction should be, "Come here honey, let me help you". That's the first thing. And soothe him down. Calm him down, and then help him.  So if you're going to tell your child what he should have done instead, wait until he's calm because he's not going to be able to learn if

he's all upset and still on the meltdown. He's not going to hear what you're saying. So calm him down, help soothe him, then help him figure out what to do next time that will be more successful

## Marvin – circle of security (5:50)

Coping & competence - 3.1 Understanding feelings and behaviour

Well, the Circle of Security is a, we think of it as a user-friendly version of a very complex theory that's been developed and set of research projects over the last 50 years and it's in the general area of attachment; the attachments that babies and children develop toward their parents, toward their caregivers. And so we developed this framework, this simplification of the theory that we call "The Circle of Security". And it is really both a way of thinking about children's relationships with their parents, thinking about attachment, and it's also been used to refer to an intervention that we've developed to help parents who are being challenged by their kid's behaviour.

We use the, a graphic that we've developed where, on the graphic, is a circle, it's an oblong circle, and there's a set of hands on the left hand side of the circle. And those hands refer to the parent. They represent the parent. And you'll see that on the top side of the circle, next to the hands, is the term "secure base". And on the bottom side of the circle, next to the hands, is the term "safe haven". Well, what we're trying to get across here is that children use their parents as a secure base for going off and exploring the world.  And we think about that as moving away from the hands, moving away from the parents as a secure base. And at other times the child comes back to the parent on the bottom of the circle, using the parent as a safe haven. And let's take those one-at-a-time. When the child is exploring, he moves, he or she, moves off away from the parent to explore, and is moving away and either exploring a new place, or interacting with somebody who's new to them and so sort of exploring a new person and developing a new relationship perhaps.  And to do that, a child, in some ways, moves away from the parent to be able to do that. A lot of times, what we as parents think is, "Oh, my child is off exploring. He doesn't need me right now". But in fact, that's not the case. The parent, the child needs the parent when the child is moving off to explore, in some very important ways. And in fact, the parent has a number of jobs to do while her child is off exploring.   And on the far right of the graphic, you'll see this box with four bulleted thoughts, what we think are the four most important jobs that a parent has when the child is exploring.  First of all, there's the job of "Watch over me.  Monitor me for safety. I am just a little kid and I am off exploring and my ability to move away from you and get in trouble is a lot more advanced than my wisdom" so to speak. "And so I need you, mom, or dad, to watch over me and monitor me for safety."

The second thing is, "I need you to delight in me, in what I'm doing". And that's something that a lot of people, even researchers haven't paid really enough attention to the notion that the child looks back at the parent when he's off exploring, or she's off exploring, and looks for a smile, a moment of delight from the parent that tells the child, sends the child a signal, "I'm here, and I'm with you, and I think you're the greatest thing since sliced bread, and if something bad happens, I'll be here to help". So the second thing is delight.

The third thing is, "Help me. Sometimes I'm off playing and doing something and I'm doing a pretty good job but then I get challenged and I get stumped, and stuck, and I can't do what I'm trying to do". In those cases, the child hopefully sends a signal to the parent that, "I need you. I need you to help me". And the idea here is it's the parent's job to help

the child, but not do it for him. Not be intrusive. To help him get over that little hump that he's experienced; that little difficulty that he's experienced, so that he can go on and finish whatever he was doing on his own. And we think of that as "scaffolding". That what the parent does, is do just enough to keep the child engaged in the activity, and keep the child experiencing success.

Then the fourth one is, "Sometimes I just want you to play with me. Sometimes just enjoy with me. Be my playmate". That's a very important part of being a parent.  And if the parent can do those four things, then, then, that's good enough parenting. That child is going to be developing a real interest in exploring, he's going to feel good about himself as he's learning, he's going to develop well, and he's going to be secure when he's exploring on top of the circle.

## Mikki Adams – elders (1:26)

Ecology of childhood - 3.3 Creating child friendly communities

Elders play a very important role within our culture. We look up to our elders. They hold all the knowledge. And all the stories that they tell all portray an instance or an event that happened within their life or that has helped them develop them into who they are. They tell stories, they help with Inuit games, they provide knowledge on our history, on the culture that we are keeping alive as well. They have information on upbringing and information on how to be a roundabout individual. They like to have hands on experience, and they like to teach through visual aid and through hands on experience as well.

Elders, they help with hunting. They will take a child, or their grandchildren out hunting with them and teach them how to, exactly how to either throw the harpoon or how to shoot the gun. And they'll show you where to hit the animal so that all the meat will not be wasted. They will teach you how to skin the animal, what tools the bones from the animal can be used for. Because the animal that we catch, we use 100 percent of the animal, nothing is wasted.

## Mikki Adams – Inuuquatigiit (1:02)

Ecology of childhood - 3.3 Creating child friendly communities

Inuuqatigiit is a very important agency here in Ottawa that provide services to the Inuit community here in Ottawa for head start program, education for mental health as well. They also provide systems navigators for Inuit that are coming to Ottawa for medical travel. That plays a very important role because most of Inuit that come here to Ottawa are from small communities. And when you come to such a big city such as Ottawa, you can feel lost and out of place.

I find that when Inuit move to the city from like such a smaller community, they're not too familiar with transportation, busing routes or what schools to enroll or if they need their immunization records up to date. Such information like that. Inuuqatigiit will help prepare them and ensure that they have all the documentation required for their child to go into school or assist them with city living.

## Mirabelli-families (1:59)

Ecology of childhood - 3.1 Sustaining home life

The vision of the Institute is quite simple, and it really was the Governor General's vision, which is to make the society, or have the society think and feel that its families are important; as important in fact, as the couples who will choose to make a family. So that if you create that familial context, then the rest becomes, kind of, self-evident. And it's a bit of a sense of finally saying, 'look individualism is running its course. You can't be the only one who cares about your children. I need to care too. Because my culture, my society is formed first of all by you the parent and then subsequently by the child, or what your child becomes'.

Now part of our sense is that your responsibility as a parent is to initiate the process. But my position, as a member of the community, is to continue and to complete what you started. And I think that's the bridge, or the break that individuality has created. It's says, 'You had the kid. Your problem'.

And we want you to make the perfect child. 'And by the way, you're on your own. I don't have any responsibility other than pay my taxes'. Well that's not an appropriate...children don't respond to taxes. They respond to smiles. They respond to an extended hand. They respond to a sense of safety. They also respond to a sense of exploration. That it's okay to fail. That it's okay to try. It's okay to be cheered on when you succeed. It's okay to be cheered on when you fail. Those are all of the things that I think are missing. If you think about the most valuable thing that a society can offer any child, is a sense of mentoring - in all dimensions of life.

## Mirabelli – private public responsibility (3:24)

Ecology of childhood - 3.3 Creating child-friendly communities

I think all of us in the 60's and 70's thought that governments could do more than any individual community through big government. Well we now know that we've tried a lot of different programs; they've come and they've gone and we're still in the same place, still talking about children at-risk, still talking about vulnerabilities whether it's educational or social.

So programs by themselves are not sufficient. Programs are perfect for the 10% of Canadian families who 'hit the wall', who absolutely need our help. And the help they require is beyond the scope of Mr. and Mrs. Smith on Elm Street. But if we don't engage at a community level on a mundane, day-to-day basis, we're never going to get beyond this programmatic approach. And I think that's the kind of commitment that's required. The expression "it takes a village to raise a child" has been over-used but it's significance is huge.

Let me give you an example how in the mundane it shows up. If I were to see you on the street today, I'd probably say "hi, how are you?" And your response would be "fine thank you". And neither of us really would have thought much about what was being asked or said. In the Masai culture, when two people see each other for the first time and they greet each other, the expression is "are the children well?" And so imagine saying that every day as you greeted each other. Would that not make the focus of the consequences of everything I do, matter?

And to sort of give you an illustration of how much we've withdrawn and who's paying the price, let me give you an illustration. Most parents today, and I did certainly in my day, street proof their children. "If you encounter a stranger, scream and run." That's sort of the natural tendency. But as adults, before instituting this approach, did we ask ourselves, "why are children vulnerable"? And if we had, we might have found out that they're vulnerable because, we as adults are no longer present on the street. Because we say 'we don't know our neighbours', we in fact, don't recognize our neighbours. So we no longer know who belongs on the street, who doesn't, we're not on the street , so when a stranger comes along, there's nobody around who knows that's a stranger.

So what we say to the child is "you're now responsible for figuring out who's a stranger, screaming and running". In the moment, that probably makes sense, but in the long term what kind of community and society are we creating when we say to the child 'start from the place of fear'? Not a place of love. Not a place of surprise. But start from a place of fear. And does this over time as the child grows up does this mean that we now get bigger and better locks on our doors and so on and are less and less and less public? Well it just means that the vulnerabilities will grow, A. And B, our police costs will get outrageous and where's the sense of quality of life? So small decisions made by Mr. and Mrs. Smith on Elm Street really shape the community in which we live.

## Mirabelli – the history of the family structure (2:53)

Ecology of childhood - 2.1 Families

Well, I can appreciate that you want Early Childhood Educators to look at a situation and say "this is important and you need to know it". I think one of the best pieces of advice I can give to somebody who is starting out in the profession is to look beyond what seems obvious. In many cases, and I can tell you a story. A wonderful friend of ours, James Garbarino from Cornell University, was in a grocery store with his kids and he was at a checkout counter and observing other parents paying for their groceries. And at one checkout counter, the child started asking for gum and the mother said firmly "no" and that was the end of it. At the other checkout counter, the same situation was being played out and the child started to cry and the mother responded by saying "if you don't stop crying I'll give you a reason to cry and then the child started to play out a tantrum.

And Garbarino, being a researcher looked at this and said "you know this is a good parent but this woman here really needs our help. We need to have parenting courses". And again, being a good researcher, he decided to do a study and he followed these women home, and I don't know how he did it but he did, and the only variable between Mother A and Mother B had nothing to do with her parenting skills. Mother B hadn't had contact with another adult in the previous 24 hours.  And so, if the automatic reaction based on the data in front is 'this person is a good parent, this one needs our help, let's create a program' we would have solved the problem to the extent that we would have created a social situation where that mother would have contact with another parents, but it would have had nothing to do with the content of the course.

She might have picked up a few new things, so the point here is quite often  we look at families today and we compare them to our own families--the families we grew up in—and say they're different, therefore we make a judgment that says they're not adequate. And that's an unfair judgment because if you were to look at not the 25-year history of families, but the 3,000-year history of families, what you would discover is, it's like an elastic band. It stretches and contracts, not as a matter of fashion, but as a matter of responding to the economy and the culture that surrounds them. So if there's a need for large families, guess what, we have large families. If that's what survival depends on.  If there's a need for smaller families because that's what survival depends on, that's what we do.

So there are many situations a family finds themselves in that's part of that continuum of the stretching elastic band. So if we make a judgment simply based on the past 25 years, we're doing a disservice to Canadian families and what we're missing in all of that is how dynamic and how responsive they are and how inventive and how creative they are in terms of forming associations and bonds of intimacy that really support them.

## Mustard – optimizing brain stimulation (1:22)

Brain development - 3 Practices for healthy brain development

The question that comes up is why should people who are going to work with early childhood, why should they understand brain development? I guess the primary reason is that how you set up the experience for the infant and toddler and young child has a huge effect on brain development. So if you understand the story and the scientific basis behind this, then you'll appreciate that the problem-based learning i.e., pl

ay, that an infant or toddler is in engaged in should be optimizing maximum stimulation to the brain through a variety of sensing pathways. So if you watch all young animals, by the way, contact for them is important. They certainly look at you in the eye, watching a kitten in my household watches my eyes in spades.  All these are sensing systems that go in and so the last thing I like to see is when I watch kids who are in a day care centre being pushed in a cart with the kids all looking forward, not looking back to the pusher, and the pusher is not talking to them.  So if you think about optimizing of signals to the brain for its development, then the arrangement you set for the child will be different than if you don't understand brain development.

## Mustard – why invest in early development (2:19)

Developmental health - 3.1 Advocating for early child development

An important question for this century, with the increasing population growth and age distribution of populations in different countries, is how do we ensure that the quality of the next generation, in terms of health and competence, is at the very best that we can achieve? The challenge is, if you really want to set that goal, and if you want to create democratic, stable, pluralistic, prosperous societies you have to do this. The only way that you can get reasonable assurance that your next generations will have greater equity in health and competence is by investing in early child development. So if you look at countries that do this, the Scandinavian countries, they have better equity in literacy and language competence than we do in English-speaking countries like Australia, Canada, Great Britain, the United States.

If you just think of that simple statistic, that says well how do you improve the language and literacy competence of populations. Despite the claims of education that it can solve the problem it can't.

Capacity and language and literacy are set by the age of three and hugely set in the first year of life. Children exposed to, in their infancy up to seven months of age, to two different languages, say Japanese and English will speak both languages fluently as adults with no accent and they'll also be able to learn third and fourth languages easily we know the structures of the brain that are part of that process.

Now just think of the United Nations problem of getting people to understand the significance of global warming. Fifty percent of the US population is at levels one and two in the adult population on the literacy assessments. Levels one and two have problems understanding how to take medicine on an empty stomach, they'll have problems understanding a consent form in the hospital.  No wonder they will have problems understanding the significance of the scientific evidence about the nature of what's causing global warming. It's a huge problem.

And so that you want to get the language skills and whatnot of your population up to high performance to be able to deal globally with the complex issue that we face as a species. That's one issue.

## Nelson – BEIP age 8 results (4:07)

Ecology of childhood - 2.3 Early intervention

The Bucharest early intervention project is now roughly in year 12. Our children are now 12 years of age. We're following them up right now. We have no data from when they're 12 because we just started, but we do have data all the way through eight years. The storyline that we see at eight is very similar to what we reported when they were much younger. It turns out that living in an institution leads to profound deficits in virtually every domain that we've looked at: IQ, language, brain development, growth, things like that. If you look at children placed in our foster care intervention placed in families, in most domains, children benefit greatly. We don't see yet that we're bringing them up to what we would consider to be typical development, so their IQs jump from 75 to 85 or upper 80s, but we're not seeing IQs of 100. The last part, and I think the more important part from a neuro-science perspective, is that in the domains that we see the intervention working, some domains have a sensitive period attached to that other domains do not. So an example of that would be for IQ, for EEG, for language, we see that children placed roughly before 22-24 months do much better than children placed after that age.

There are a few domains where we see an intervention effect, but no timing effect. An example there is that we see dramatic reduction in children experiencing anxiety or depression, but it doesn't matter how old they were when they went into foster care, no matter how old they are, they get less anxious and less depressed. There are, however, a few domains where we're really not seeing any intervention effects at all. So we're not seeing really an improvement in executive functions, and related to that is we haven't seen a dimunition in what we call externalizing behaviour problems like attention deficit disorder or conduct disorder. So the children placed in foster care are not showing any less ADHD than kids who stay in the institution.

Now we think that the reason for this could be that the average age of placement was about 22 months so its entirely possible we placed the kids too late. If that's the case though that means the neuro circuits that underlie things like ADHD are getting set up before the age of two, which begs the question of how early in life we should be screening kids for ADHD.

So one question I've often gotten is why is the BEIP as we call it so important? What's new about it? First of all it turns out that there are very few studies that have ever looked at currently institutionalized children at a large sample, and none have ever looked at this from the lens of neuro-science biology. Second, this was an intervention study and it allowed us to test the question of sensitive periods. Whether kids placed in more favourable environments at particular points in development would do better. There are lots of monkey studies like this but none with humans. So I think the lessons we've learned from this that are most critical is that there are sensitive periods in human development. That children taken out of really adverse circumstances and put into much better circumstances, better families, at or before particular points in development can really benefit even if those children might have been handicapped in some way to begin with.

And I think the last thing is it's given us a clue as to the mechanism. So, at the AAAS meeting last week in Vancouver, someone said to me "what didn't we already know about your findings?" and I said well, we weren't entirely surprised that kids who grow up in institutions don't do very well, but now we know why, with our biological data and our neuro-science data, we have some handle as to what is going wrong in brain development that leads to children having anxiety or ADHD and the like, so I think that's the last lesson, can we not only describe the effects of early life adversity, but can we explain why those effects cause the damage that they do.

## Nelson – brain and memory development (5:17)

Brain development - 2.3 Memory

Now in memory the goal here was to understand what are the areas of the brain that develop over the first one to two years of life that facilitate the development of memory and then to be more specific in the type of memory we look at so we no longer think that there's a type of memory, there's probably different types of memory so memory for what you had for breakfast this morning or the name of the teacher you had in Grade 10 English is quite different than memory for riding a bicycle or playing an instrument. And so our goal is to understand the different types of memory, their development on a trajectory and what parts of the brain are facilitating that development over the first two years of life.

And what we find there is that we see a very early form of memory that depends primarily on a single structure in the brain called the hippocampus which lies deep in the brain and it's hard to show you but this is the outside surface and this is the inside. It's a structure that lies in here. Basically in the mid-point between your two ears almost. And that's called the hippocampus. We know that that matures a little bit early. We know that that matures in the first month or two to the point where young infants have some evidence of, can show evidence of memory. But over the next several months that area of the brain and areas in the other portions of the temporal lobe which is the part of the brain right above your ear, right through here, start to mature more, making possible more sophisticated forms of memory and the ability to remember things for longer periods of time.

And then the last event probably is long-term memory. So most of us are familiar with the following phenomenon. I say to you: What's your earliest memory? How old were you? And what most people report is that they were usually not younger than two; on average three or four for those early memories. Every now and then you'll find somebody who was twenty or twenty-two months but the accuracy is a little bit questionable. So that leaves open the possibility of, that leads to the question of so why is it we don't remember the events of our lives before the age of two. And one possibility, in our view, is that the areas of the brain that store memories for the long term are not in the temporal lobe or in the hippocampus but they're outside. And those areas develop slowly. And so as kids get beyond the age of two those storage sites for long-term memories develop.

And then the last event is that we all know, some of us more than others, that as we get older, our memory starts to not be as good and we need the little tricks for learning how to remember things. Those are mnemonics. So you repeat something over and over again and you remember to write it down. Things like that. The frontal lobes play an important role in our use of strategies, the little tricks we use to help us remember. And the frontal lobes mature slowly and very late. They don't really start to mature in a big way until four, five or six. And it's not until really adolescence that they're much more mature. And so the last change in memory would then be the facilitation of memory based on development of the frontal lobe. And that's why children, when they're four, would do the following: If I say to you: I'm going to say some numbers. How many can you remember? You might say six or seven.

If I say to a four-year old: I'm going to say some numbers out loud, how many can you remember? They might say 25. So you'd give them some numbers and they'd remember on average, four. So then you say, Ok, let's do it again. How many do you think you can remember this time? And they'd say 30. They have no perspective that things can be forgotten, in part because they haven't developed the strategies to help them remember because the areas of the frontal lobe are immature.

So those are sort of our studies of memory. Again, in babies we focus on recording the neural correlates, or the electrical activities we associate with memory and as kids get to be five or six we can actually look at the anatomy of their brain by doing functional magnetic resonance imagery. The last thing I'll add about memory is that a big focus of our work, particularly the applied side, is that we're not only interested in how memory develops in typically developing children but what happens in children at risk for problems with their memory or other cognitive functions?

So we spend a lot of time looking at infants and children, particularly infants who suffered various pre or perinatal brain injuries, that may predispose them to having problems in cognitive development, particularly memory development. And the goal there is not only to track their development but as well to develop the tools that will allow us to identify those babies much earlier than we were ever able to before. Typically a learning disability isn't diagnosed until kids are school age. And if we can, in a sense, flag children at risk for a learning disability when they're a month old, or six months old, then we can intervene much sooner. And the last part is that the tools we use to study these things and event-related potentials, can be used to evaluate any intervention. So an example would be if we know what a normative brain response looks like in a memory task and what an abnormal brain response looks like, if we do an intervention, can we see that abnormal response becoming a normal response? So then we have an outcome measure in our intervention. So that's the application part to the work on memory.

## Nelson – Bucharest early intervention project (6:37)

Brain development - 2.2 Stress

So, I have the distinction of being able to direct a research network that's concerned with the effects of early experience on brain development. And we actually have a web site which is www.macbrain.org. Now in this group of researchers, there's about nine or ten of us together who work together which includes developmental neural scientists, psychologist, psychiatrists, pediatricians and the like. What we're trying to understand is the role of experience in influencing brain and behavioral development. A common way to do that is to look at the effects of early adverse experiences. So it's of course ideally the case that we would understand how good experiences affect brain development but one way to infer the role of experience is to see when they're bad experiences. And common in different parts of the world but particularly in Eastern Europe including Russia and Romania and places like that and in Asia like China there are countless children who are abandoned at birth because their parents, for one reason or another, can't take care of them. And these children are typically placed in institutions or orphanages. An orphanage is not a good name for these in part because it sounds like the child is an orphan and in fact rarely are they orphaned, they're simply abandoned. So their parents still are their parents on paper even though they never see the child. So by the late 1980s or early 1990s in Romania there were over 100,000 children in that country who had been essentially abandoned in these institutions and were being brought up by the state.

And the concern is that these are not optimal living conditions. As a rule for example, with babies, there might be as many as 15-20 babies being taken care of by one person. And of course anyone who's had children or works with children knows that that's not optimal. For example, we would never bring our children to a day care centre where there was only one person watching 20 six-month olds. So, inherent in institutional care is a whole range of forms of deprivation. There's sensory deprivation. Often these children lie in a room staring at a white ceiling and white walls for the first 12 months of life. There's linguistic deprivation. There's no one talking to them. There's cognitive deprivation. There's no one stimulating them. And very importantly, there's social and emotional deprivation. There's no one really loving them.

So we were interested in looking at the effects of early institutionalization on early brain and behavioral development. But as importantly since we anticipated that this would lead to negative events, that is, behavioral and brain development would not be optimal by being raised in institutional care we were interested in whether we could develop an intervention. So in this project, which is being done with my colleagues Charlie Zina, who's a child psychiatrist at Tulane University in New Orleans and Nathan Fox who's a developmental psychologist at the University of Maryland in the United States, we designed a study that worked as follows.

We looked at a sample of about 150 or so children who were abandoned at birth and placed in various orphanages in Bucharest, Romania and then we had a second sample of children who were being reared at home with their biological families in the greater Bucharest community. After we did a very extensive baseline assessment we

measured cognitive development, social/emotional functioning, linguistic development, physical growth and development, brain function, etc. etc.

After we did the initial baseline assessment, half of the children who had been placed in the institution were then placed in foster care that we created. And these were randomly placed children. So we didn't pick them we just randomly assigned them. And the reason we could do that, because it raises in your mind some ethical questions about which child goes to foster care and which does not, is that foster care did not really exist in Bucharest at this time. Moreover, this is a country that, for many years, has a history of abandoning children, not taking them in as foster children. So it was very challenging but we eventually identified about 70 or so families willing to take kids in and we could then pay for those placements.

So the study is longitudinal, meaning that we're planning to study these children for several years, probably about four years, or there abouts. And what we're then looking at is the development of the children who are initially placed in the orphanage or the institution and now are placed in foster care relative to the kids who are placed in the institution and stay in the institution and then relative to the comparison group of kids who live at home with their parents.

So far we've been able to look somewhat exhaustedly at our baseline data and we're now just beginning to look at our foster care date. And the baseline data do show, in fact, very, very negative consequences to this rearing environment. So an example is that for measures of intelligence, broadly defined because it's hard to measure intelligence in a one-year old, but using a developmental test, if our community sample had scores of about 100 on that test our institutionalized sample was scoring at about 65. On measures of language development and on physical growth and development, the children in the institution are very, very behind in all of those respects. When it comes to social/emotional development one of the things we're looking at is attachment behavior, and that's the relationship an infant or a young child has with his or her primary care giver. We're finding that a great many of these children have disturbances in attachment; whether they've failed to develop an attachment or the attachment they've developed isn't as healthy as we'd like to see. So of course now the big question is what are we seeing among those children we've placed in foster care? And we're just beginning to look at those data but we find a dramatic improvement in physical growth and development, a dramatic improvement in language, so their language starts to take off.

We find that there's only a very modest change in their cognitive functioning but that may be because the children have only been in foster care a few months. The most intriguing finding is that if we can look at the EEG of the children in the institution versus those in the community sample there are dramatic differences. So, using my hand, if this is the normal EEG, this is the EEG of the children in the institution. It's a fraction of what we see in the community sample.

After a minimum of three months in foster care we're starting to see that EEG normalize and look a little bit more like the kids in the community sample. And as our children get further along in the study we hope to continue to follow them until, on average, they're about four to five, when they finally finish the study.

## Nelson – face recognition (3:12)

Brain development - 1.2 Experience-based brain development

Let me first talk a little bit about the work we've done on face recognition. The first question we should ask is so why would you want to understand how the ability to recognize faces develops? Prior to the time when infants develop language most communication is non-verbal. So that means really the first one to two years of life a lot of communication between a baby and his or her primary care giver or anyone else is non-verbal. So we need to understand how it is babies read faces, both at the superficial level of "who is that?" to the more fine level such as "how does that person feel right now?" And so we put a lot of effort into understanding that development as well as what are the neural systems, that is, what are the parts of the brain that are developing that facilitate those abilities to recognize faces and facial expressions of emotion.

The other part to it is to understand how experience influences that process. Some people think that this is such a fundamental ability that there's an area of the brain dedicated to recognizing faces and it's there at birth. We take a different view which is that we think that there's an area of the brain that has the potential to become specialized for recognizing faces. But it's only by seeing faces that that actually happens. And very good evidence for that actually doesn't come from this lab but it comes from Daphne Marro's lab at McMaster University. Daphne Marro and her colleagues have looked at a sample of children who were born with dense cataracts. These are opacities over the eye and at a certain age, usually a few months after birth, have the cataracts removed. And as a rule, they have a wonderful outcome. Their visual acuity improves dramatically, they see quite well. But it does turn out they still show subtle deficits in recognizing faces.

So those data, coupled with our own data where we record brain activity, collectively says that experience really does thrive that ability. And I'll give you an example. In the paper two former students of mine published last year, Michelle DeHawn, who was going to McMaster as an undergraduate and then came here to graduate school and now is --- University College, London and Olivia Pascales who is from France but now works in England and did part of his dissertation here, showed that, predicted rather, that early in development infants have a very broadly tuned perceptual apparatus for recognizing faces. So what that means is that they should be quite good at recognizing and discriminating all sorts of faces but as they get more experienced with just human faces they would lose that ability.

So we predicted that babies would, young babies would be as good at discriminating two monkey faces as they would human faces. Now anyone who has seen monkeys, unless you work with monkeys, know that they all look alike. And at six months, they found six-month olds were as good at discriminating two monkeys as they were two humans. But by nine months they were like adults. They could not do two monkey faces anymore. And so the logic behind that is that's because by nine months infants have had three months more experience seeing human faces and they are gradually losing the ability to discriminate monkey faces. So that's another way to demonstrate that experience is important.

## Nelson – gene expression (1:17)

Brain development - 1.1 Brain architecture

We all know we have genes. The Human Genome Project has now revealed that humans have about 30,000 genes in their genome, that is their constellation of genes. Many people think that genes are just static, but in fact, genes turn on and turn off at different points in development. A classic example of course would be puberty. The genes that regulate pubertal development don't get expressed until 10, 11, 12 years of age. There are some genes that get turned on at one point and turned off at another. But then there is an interesting phenomenon where gene expression, that is, how a gene reveals itself is influenced by experience. So we do know that if, for example, you experience a very stressful situation, I don't mean a test, but something very, very stressful - loss of a parent or something like that, in that immediate period there'll be a set of genes that will express proteins that will in turn affect brain function. And that's another way to think of gene expression. So by expression I mean at one level, at the molecular level the expression of proteins, at another level they express themselves in changes in behavior we refer to that as the phenotype, the behavioral expression of the gene.

## Nelson – scene: nelson's lab (3:30)

Brain development - 2.3 Memory

There are several segments in this CD. The first segment is entitled Voice Recognition and here what you're looking at is our testing of the newborn's ability to discriminate mother's voice from a stranger's voice. So in the beginning what we're doing is putting on electrodes, put on the baby's head and then we place a small ear insert into the baby's ear while the baby is in a light state of sleep. And then what the baby hears is their mother or a stranger saying a simple word like 'hi baby'. So they hear 'hi baby' by mom and 'hi baby' by a stranger. And we present this about 100 times, maybe 50 times each and that entire time we're recording the baby's brain activity. And in one segment of the CD you can see on a blue screen the baby's brain activity going up and down like that. And the goal of that work is not just to look at what are the neural systems involved in recognizing mom's voice, but as well we're looking at a clinical population of babies who we think have had damage to the part of the brain involved in memory who may not have benefited from the experience of hearing their mother's voice and therefore may not recognize their mother's voice at birth.

Now in the next segment which is called Face Recognition.  What you see us doing there something comparable to what we saw in the newborn. This is a 6-month-old baby. We place a net of electrodes on the baby's head and then what we're doing is showing the baby pictures of faces and we want to know can they recognize a face they've seen before from a novel face. And so again we're recording brain activity and again on the screen you can see a picture of the baby's EEG. And the goal of that work is to look at the neuro correlates involved in discriminating one phase from another phase.

This is an older child. This is a 4-year-old entitled Emotion Recognition. Again we're recording brain activity except this time we're showing the child different pictures of facial expressions and we want to know, a. does their brain activity show that they can discriminate one expression from another, and b. does their brain show unique patterns of brain activity to some expressions rather than others. For example in some of our earlier work we demonstrated that anger expressions show a particular aspect of changes in brain activity that we don't see with other facial emotions. So the goal of that work is to look at the neuro correlates of recognizing emotion.

And finally in the last segment entitled FMRI we're showing how we actually conduct functional magnetic resonance imaging studies. This is an 8-year-old child where she's brought into the scanner room and you can see what the tunnel looks like, the scanner. She hops up on the bed which goes up and then the child slides into the tunnel and then she's given a button box and what happens is that on the screen in front of her we're showing different patterns and she has to push a button that corresponds to which pattern she's seen before and which is novel. And so all she's doing is pushing a button that corresponds to whether she's seen one of those patterns before and which one she hasn't seen before. And during that entire time we're taking very detailed pictures of her brain. So we'll know precisely what part of the brain was involved in performing our task. And that whole test will take about 20

minutes.

## Nelson – recommendations for parents (2:11)

Coping & competence - 3 Supports for coping and competence

I often get asked by parents what recommendations do I have about raising their kids? So let's start with the following premise: our species has survived a long time without television, without radio, without all sorts of fancy stimulation like Baby Mozart and things like that. So I think the pressure should be off parents to feel like they have to stimulate their baby every possible moment. We have this concept called an expectable environment which is that when a newborn is born, they sort of expect hey, I can't talk I can't walk I can't do much on my own, someone's going to take care of me. But that doesn't mean you have to be given horseback riding lessons and language lessons in four different languages. It means that someone's going to be taking care of you sensitively, consistently, they're going to meet your physical needs as well: feed you, change you and things like that. As children grow older, what I would recommend to parents is that they get a sense of the things their child is gravitating to. If your children love to have them read to them, then you should read to them. My one concern is kids being over stimulated, and you see that in particular in usually middle to upper middle class families who feel that, the joke we use in Boston is that parent's think this will be the ticket into getting their kids into Harvard. What I worry about is parents obsessing too much about stimulating their kids too much. If a child learns to read at four versus six, over the lifespan of 85 years, what's two years going to make a difference? Not very much. And so I think kids need to have fun. They need to play, they need to learn and they need to be loved but they don't necessarily need the high pressure stimulation that is often coming at them. And the last thing is that our children's lives are much more structured now even than they were twenty years ago, or more than twenty years ago and I think that works well for some kids but less well for other kids and I think some kids rebel against how structured their lives are.

142

## Nelson – recommendations to policy makers (1:49)

Developmental health - 3.2 Shaping public policy

I have a couple of things I'd like to tell policy makers. One is - listen to the science. I think often policy is based on what people think people want to hear or their personal experience, but it's not based on science, so I think policy makers need to listen to the science. Second I think they need to pay careful attention to the science that for what happens early matters for what happens later. In this field referred to sometimes as developmental programming we can demonstrate that events that occur very early in life can have downstream effects thirty, forty, fifty, or sixty years later, and so often politicians and policy makers take the short view of thinking what can I do early in development without realizing those things have to be sustained. So early in the development of Head Start they did stimulation for three and four and five year olds and then that was it. But the best evidence is that there needs to be continuity over time. So that means policy makers have to be willing to commit to funding things for a long period of time not just a one shot deal.

Lastly, I think they need to strip out the politics from policy and really do what's in the best interest of children and not necessarily what's in the best interest of different constituencies. Kids often get caught in the middle, and that's unfortunate because it's not really in the best interest of the child. One example that would be sometimes policies about international adoption, since I'm caught up in that, there are many countries that have now banned international adoption for political reasons and the only people getting hurt with this are the kids. So now the kids languish in institutions instead of getting to be adopted.

## Nelson – research tools (3:20)

Brain development - 2 Early brain development research

We use a number of tools in my lab to study brain development in infants and human children. When children are less than five or six years of age we primarily focus on recording the brain's electrical activity. And the way we do that is we place little sensing devices over the surface of the scalp. We can do that with a little cap or a net. And essentially what we're doing is recording the electrical activity that occurs between each neighboring neuron or brain cell, that then moves or propagates to the scalp surface where we place these sensors.  And that tells us something about the moment by moment transactions that are going on in the brain during the time a baby or a young child is thinking. Now when children reach the age of five or six, we can also start to do magnetic resonance image scanning on them, specifically functional magnetic resonance imaging. And the reason we have to wait is simply that kids are too prone to wiggling around before they're five or six. Even five or six is pushing it sometimes.

So here the child lies in a tunnel. Many people have seen what these MRI scanners look like. And while they're in this tunnel we're presenting pictures or sounds to them and we're asking them to do something, such as show us what they remember by pushing a button. The only constraint is that you have to lie very, very still. We can't tolerate more than a millimetre of movement. So a younger child, even though they think they're sitting still or lying still, in fact is probably moving a little bit. So in our experience, once kids get to be around six, they're more likely to be able to sit still for ten or fifteen minutes at a time. Actually testing children in this is much easier than testing adults. Children as a rule are never claustrophobic, they kind of like being in that. If you go to playgrounds nowadays, you'll notice there are lots of little narrow tunnels that the kids play in. So they're kind of used to that.

## Niles – curriculum (1:02)

Communicating & learning - 3.3 Creating curriculum

And so one of the first lessons that I often teach students about when we talk about early childhood education with tribal community is that all of us have to do a reflection of who we are and what we bring, and be willing to listen. Ultimately those qualities should be considered, in my opinion, 'best practice'. And it's not the idea of a certain curriculum fitting each community. The fact of the matter is if I were to go to the Hopi tribe and say 'let's develop a curriculum for Hopi kids, I couldn't use that curriculum for Navajo children, nor should I. So the heterogeneity of the communities also makes things a lot more complex than a lot of times people are interested in working through because we want an easy answer. But when it comes to these types of communities, I often find that the best place to start in communities is be really talking about what it means to be a community member and how that would relate to early childhood programs.

## Pascal – communication (1:01)

Developmental health - 3.1 Advocating for early child development

One of the things that's absolutely critical, when we're releasing evidence that has some import regarding the social and cognitive development of children, it's important to capture the public's imagination. It's important to have some story telling at the front end of it. It's important to put in human terms the meaning of qualitative and quantitative data it's really important to, in an emotional way, connect with the public. You connect with the public with a story, a real story about how lives are being changed as a result of this evidence, people are more likely to take a peek at the evidence. More likely to embrace it if there's a human dimension to it that is the kind of portal that leads people to find out "so why is this story so compelling?"

## Pascal – research, practice and policy (3:36)

Developmental health - 3.2 Shaping public policy

I think it's really critical that when it comes to policy making whether its education, social policy, social services, health, that we be far more evidence based from a policy point of view

When it comes to what kind of evidence, I think it's really critical to be clear about what kind of questions you're asking. So for example, if we're looking at early education and social services, I think we need to ask questions like how's my child doing because that comes closest to what parents and guardians across all jurisdictions are interested in, so how's my child doing? How's the family doing? Because children reside in all sorts of interesting arrangements called different kinds of families and I think we need to gather evidence that's distinct from just the individual child that focuses on the family. Next question I might want to ask is how's the program doing? So the program that's serving and supporting children and families I think needs to have focus. How's the community doing? Because I a lot of what we're doing is community development as we develop villages more able to raise children and families capable of raising children, and the interaction with the community and those that are elected officials to support community, so how's the community doing? And then I think the larger question is how's society doing? I think we need to have information gathered on an ongoing organic basis regarding the economy, and what's the economic return on these investments

So it's absolutely critical to have this wonderful dynamic between those who do research and those who do policy. For me it's, I call it the three legged stool. When you have a reciprocity between practitioners, who are consulted by researchers and practitioners who become more sensitive and excited about the latest evidence, and there's people who can guide them about how to use the latest evidence, and if we can get the relationship between researchers in the academy more in synch with policy makers in government, and vice a versa, that three legged stool will change the world.

Researchers and practitioners need to have a real active respect for each other and reciprocity. Researchers talk to practitioners about the kind of questions practitioners like, and even when academics really have good relationships with the practitioners, and not enough of us do, it's important that academics and practitioners also have a relationship with policy makers, who live in a very different culture, and connecting that three legged stool that I talk about, researchers, practitioners, and policy makers is the important word communications. Because if we don't have communications, that people can understand and talk about, we lose the value of gathering the evidence. There's no sense in gathering a lot of evidence that's nice for journals and books but that doesn't have a communicative value to the public at large that encourages governments to make certain kinds of decisions and avoid other kinds of decisions. I call this evidence-based story telling, and it's also important to make sure we attract new story tellers. We need people from the banking industry.

## Pelletier – Play-based program (2:50)
Communicating & learning - 3.1 Guiding and teaching

I see a play based program as one that capitalizes on children's natural curiosity, natural need to play. To engage in active exploration or maybe just fantasy play, but it capitalizes on what children do naturally. Good educators recognize that children need to play, and they set up environments that facilitate it. Play takes many forms. Play can be active outdoor play and some children will describe play in that way. They see play as climbing on the climber, chasing friends, that kind of thing. Other children will describe play in different ways, like playing in a dramatic play centre where they're taking on roles and engaging in pretend play. Other children describe it as talking with their friends. So play takes different forms for different children, and all forms of play are important.

Increasingly we're seeing the real value of complex socio-dramatic play in terms of fostering children's ability to regulate not only their behaviour but their emotions and their language, because in order to engage in this complex socio-dramatic play, they need to take the perspective of the other. They need to remember who is playing what role. They need to maintain the language that's going to be of interest to their friends. And so good teachers will set up opportunities for children to engage in that kind of play. I think it's also important to think about what children want or expect in say a full day kindergarten early childhood setting. Really, when they come into kindergarten, they're big kids, and they might think that this is a time for them to do some work. So it's not that they're engaged in pretend play from morning until evening, it's that teachers capitalize on their need to play, but they also know to infuse some sort of instruction whether it be paying attention to sounds, phonological awareness, but these can be done in enjoyable ways. It doesn't have to be sitting down with pencil and paper and tracing and that kind of thing.

So I really see play as being something that's intentional on the part of the educators. That recognizes individual children's understanding and need for play, and that sets up environments in which that can happen, and that teachers and early childhood educators know how to base their assessment on what children are learning in play.

**Pelletier – setting the classroom for play (1:59)**

Communicating & learning - 3.2 Planning environments for learning

I think a classroom in which you tend not to see as much play might be set up differently first of all, so the space might be set up in a way that encourages more seat work and less activity that may not have as many opportunities for children to make their own choices and explore, but rather to do what it is that the teacher or ECE has asked them to do. So you might see desks, although we tend not to see that so much anymore, but you might see desks, but you might see groupings of seat work areas. You might see play centers if you will around the outside of the classes, something as a place where children can go after they've finished their work, rather than play being set up as the classroom space, where there is a large open space, where activity centers can be combined in ways that capitalize on children's imagination and need to put things together in their play. So I think really, really you see the space. You see materials in a way that engage children's interest, that capitalize on their need to make choices about what they want to do. Educators allow them to use materials in creative ways, not in particular didactic ways, but in ways that build on their curiosity. So their space, their materials, their time is set up differently too, so time would involve large time blocks rather than chopped up time for language and then math and then science, these things would be more integrated and there would be large time blocks. For instance, we know that children won't even engage in play if they know they're going to be stopped.

## Peters – early childhood educators (1:27)

Ecology of childhood - 3.2 Strengthening early child development programs

Best words of wisdom for early childhood development, I think it is to facilitate, to optimize the development of the child. It is critical that the child have ample opportunities to try new things, to learn new things, but in a shielded and protected environment, but to try new things and be encouraged and supported and reinforced. I think parents need to learn more positive ways of dealing with their children, more positive ways of disciplining their children, more positive ways of building their strengths. Children are so incredibly curious and are so incredibly active and open to new experiences and it's really up to us not just as parents but as early childhood educators to provide them with those environments in which they can succeed. Every once and a while they'll fail of course, but nothing breeds success like success and all the talk about developing self-esteem can most effectively be done by allowing the child to really experience success many times during the course of his or her day.

## Prentice – historical perspective in Canada (2:03)

Ecology of childhood - 2.1 Families

So the reason that Canada doesn't have a national integrated system of early learning and care is really a legacy of history.  Like many liberal countries, the liberal countries like Canada, the United States, Australia, New Zealand, the UK, we have this burden of history, which was that education started as a universal program somewhere around the beginning or the early days of the 20th century.  But child care got stuck in social welfare and by being stuck in social welfare, education went in one direction and care went in another.  And it was easy to do at the time because there were few working women and it seemed like only unfortunate families needed to use child care.  And although World War II changed a lot of things in Canada, it's the only time we've ever had a national child care program, one of the first things the federal government did when the war was over was to cut the national agreements, leaving it back up again to provinces to operate or not operate child care programs as they saw fit. And in the era of a post-war baby boom and an era of rising income that looked like, for many middle class families, one salary would be enough.  You'd have dad at work and mom at home and your 2.3 kids and a dog in the suburbs and it really looked like child care wasn't necessary.

There were a lot of problems with that vision even at the time.   Many families didn't fit that model.  Women have always worked.  There's always been a need for child care. But it's really been since the 1970's when Canadian women started pouring in to higher education and in to the labour market that the pressures really built.  So for 30 or 40 years we've had very high rates of women's employment and most women and families still having to struggle to put together child care because of this accident of history where we've just imagined that child care is a private responsibility and families will take care of it themselves.

## Prentice – universal child care system (2:05)

Developmental Health – 3.2 Shaping public policy

Well, describing a universally accessible publicly funded child care system in actually pretty straightforward because we can use the international examples of countries that already do it.  We would go to Sweden or Denmark or any of the other Nordic countries.  Possibly to France or even to Germany and we would look at how they organize child care.  And we would find that services are universally available to all children and families who need it, irrespective of parental labour force participation, delivered almost universally by the municipal level, available at low or free costs depending on family income, by highly trained caregivers meeting really good regulations.  It's very far from what we have in North America.

The value of such a universal child care program is multiple.  It's terrific for children who get a wonderful start for the many reasons that we know that children benefit from good quality ECE.  We don't know how to quantify it yet – the gains for women in terms of gender rights and equality rights but it's very good for women because we know that absence of child care affects women more than men, mothers more than fathers.  We know it would go a long way in Canada to helping employers.  Business leaders will tell you that they conservatively estimate work/family disruptions to cost the Canadian economy about $4 billion a year in productivity.  And we know that it's good for society in a general way which is despite kind of public perception that child care is just an expensive babysitting program, new economic evidence tells us that child care more than pays for itself.  We know this both from forecasts, hypothetical and based on research, but we also know it from Quebec's experiment which has been doing this back since 1997 and providing child care to parents there for now $7 a day for almost a generation.

152

## Roos – comparing social and biomedical factors for health (4:33)

Developmental health - 2 Developmental health research

Another way that we've looked at these data on trying to understand what matters in terms of kids' outcomes are comparing the impact of social factors with the impact of biomedical risk factors. I don't want to say everybody knows but it's generally acknowledged that when a child is born very prematurely or if a child is born very low birth weight that the child is at risk and pediatricians tend to follow them very closely, They may see the mother, ask her to bring the child in more quickly, they put intensive resources, critical care, they know this child's at risk and needs resources if it's to recover and have a reasonable life.

So, one of the things which we've been doing is looking at, over the course of a child's life, how likely is a child born very prematurely or very low birth weight or moderately low birth weight or moderately prematurely: how much has their health been put at risk, associated with these birth characteristics. And we do find high rates at which they continue to be hospitalized through life and through their childhood, as we would expect. What we also did was to see: what about kids who, at birth, their parents are poor, that they are – parents are on income assistance or live in a very poor neighbourhood.  Or that this is a child of a teen mother and what does this social characteristic, what does this imply for the child's health characteristics over the course of childhood? How likely are they to be hospitalized on average, over their childhood? And how do these risk factors compare to the biological risk factors we're so certain of?

And one of the most remarkable things about this research is that we find very similar health risks from the social factors: from poverty, from young mothers, as you do from the biological risks. And typically, a child at social risk isn't recognized as such by physicians, by society. So one of the things we've been trying to do is point out this difference but also that there are many more children at social risk than at biological risk. It's extraordinarily unusual, there are very few children, fortunately, who are born at very low birth weight or very prematurely. But what we've been trying to communicate is the social risk factors need to be treated as seriously as the biological risk.

Having looked at these data, the question one. . .  which sort of immediately comes to mind is: how do we get people to care about these issues, about the social factors in the same way they care about the biological ones? And I have to say I've been really pleased that there's a whole new area in pediatrics – the physicians who look after kids -  who are beginning to understand, in fact it's called "social pediatrics", there are pediatricians who recognize the importance of these social factors and are beginning to try and teach their colleagues as to how to start thinking about these issues and how to make the case for government, where investments need to be made in early childhood development, is an extraordinarily important period particularly targeting these high-risk groups, high risk social groups, not just the high risk biological groups.

## Roos – early risk factors (3:45)

Developmental health - 2.1 Social determinants of health

Another area that we've been using these data for has been to try and identify who are children who, through no fault of their own, but really through their, where they were born, where they live, what their circumstances are, are really marginalized and placed at risk. The kinds of factors that we were able to look at were: number 1, was this a child of a mother who was a teen when her first child was born? We started looking at, was this a child of a teen mother? But it turns out that the child is basically at risk because the mother is at risk – for poverty. So it's not that the teen mother, per se, is such a terrible thing if one provides support. But there's no question that children of teen mothers are very much at risk. So that was one risk factor.

We also looked at families who had, the child lived in. who had received income assistance. Again, poverty being the driving problem. We also looked at families where, or children - where the child had been taken into care, or the family had been offered protection services, because of, typically, dysfunctional behaviour in the family, for children in that family. And we found, one of the most interesting things we found was how broad an issue it is in, particularly in Winnipeg and the rest of Manitoba, finding a child with one of these risk characteristics. I mean, I personally don't know many children of teen mothers or children in care or children in poverty - whose parents are on income assistance. But when you look across the province and you look at children who've experienced one of these characteristics in the last 10 years, 10 years of their life, we're up to almost a third of Manitoba's children who have this characteristic.

So what we've been interested in knowing is when we have children with one or more of these risk factors, how does this seem to affect them? What is it associated with?
So we've looked at characteristics such as does the child, the young woman, does the child become a teen mother herself And there's no question that the more risk factors one has the more likely the young woman is to become a teen mother.
We've also looked at how likely is a child to graduate from high school. And there's a huge difference between, and here, we're not talking about the most affluent group in society, we're just saying, compared to the two thirds of children who don't have one of these risk factors, again - enormous differences.

We've looked at, is the child, when they graduate, or they don't graduate from high school, when they become a young adult, how likely is that child to go on, receive income assistance, i.e., be unable to find a job and support themselves. Again – big differences. So, it is clearly, we're finding these risk factors place children at – they're very likely to not have a good start in life.

## Roos – how income affects health (4:11)
Developmental health - 1.2 Growing up in poverty

One of the things which we've been very interested in is how do health differences, which we know exist across social groups, what's their generation? And so one of the studies which we've been doing is trying to track people who always live in, or children who always live in low income neighbourhoods vs. those who always live in middle-income vs. those who always live in high-income neighbourhoods throughout their childhood. And what we find is that first year there are very big differences in hospitalization rates and in various health characteristics. First year, bit of the second year and then many of the health differences essentially disappear.

Basically, kids are remarkably healthy from about age four through maybe age 10 or 11. When you get to the teenage years those differences start emerging again. You're getting accidents, you're getting injuries, depression. There are a whole series of things, which are beginning to develop. But what's also very interesting is over this whole period, educational differences are widening. What we find is when we compare how kids do on the, I think it's the Education Development Index, the EDI, which are administered to kids right when they enter school. There are differences across groups depending on whether you live in high-income areas or low-income areas in the direction in which you'd expect: high income area kids do better. But the differences aren't huge. By Grade three the differences are larger, by grade seven and nine they're getting bigger. By 12, I've just described, they're terrible. And we know that health differences also start re-emerging in the teen years and are remarkably large as we go on.

One of my favourite examples, which I think is enormously powerful, is there was a study at Duke a few years ago which looked at how many. . . what would we add to people's life expectancy if we could wipe out cancer. That is, I mean we hear about prostate cancer, we know breast cancer is a killer. I had a friend who recently died, I actually had a niece who died of cervical cancer. Just an incredibly awful disease – cancer. What we would add to life expectancy would be almost three years if we could give every child at birth, a pill which would mean they didn't have to worry about ever developing any type of cancer and you made the heroic assumption that they wouldn't die sooner of something else, because we all do eventually die. At the time the study came out, we were doing a comparison across Winnipeg neighbourhoods, of life expectancy. The life expectancy difference across the poorest Winnipeg neighbourhoods, and that's the 20% of people living in these neighbourhoods, so we're not talking about narrow little neighbourhoods, so we're talking about 20% of the poorest neighbourhoods, compared the 20% of the highest income neighbourhoods - for men there's a 12 year difference in life expectancy. So in terms of understanding how important these differences are that to me says it all.

## Roos – no birth differences (1:52)

Developmental health - 2.1 Social determinants of health

We also have looked at, because one of the areas we spend a lot of time on is looking at health of these young people. And one of the most interesting things is that despite the fact that we find these huge differences, for example, in educational outcomes. We compare these kids who have all these risk factors at birth, we find very few differences in key health indicators. Overwhelmingly, whether they have 3 risk factors, whether they're born in poverty, child is eventually taken into care, mother who's a teen, the children tend to start out, over 90% of them have a normal birth weight, normal gestational age and an Apgar score, which physicians take at 1 minute and 5 minutes after the child is born to say is this basically a normal, healthy, thriving child or not - very few differences at birth. Within a year one finds very big differences in hospitalization rates across these kids with those who are identified as at risk having much higher hospitalization rates than others. One risk is better than two, which is infinitely better than three

One of the questions, which we're always asked is, is this inevitable that these kids are just not going to make it? And that's why those birth characteristics are so interesting because we're showing that at birth these kids look, in fact, like everybody else.

## Rundle – Indigenous child-rearing practices (1:32)

Brain development - 1 Early brain development

What we know about children's development through research, current research, particularly brain development. We know that children learn through their senses. And a lot of the teachings and practices that we traditionally, historically have for children, you know, pre-birth when children are born in those first few years and then on into early childhood. Things like singing to the baby while they're in the womb, hearing the drum, those kinds of practices we know support children's development, that children are already learning and research has shown that.

And then some of the practices when children are born, things like being swaddled in cradleboards or moss bags, co-sleeping with parents, those kinds of practices support attachment. And we know that current research around attachment is important for children's development.

These kinds of things that research shows us now, Indigenous people have been doing for thousands and thousands of years.

## Rundle – Indigenous perspectives on child development (1:21)

Brain development - 3.2 Observing child development

In the Indigenous perspective, we would see the stages of development every seven years. So the first stage, which is called the Good Life, from birth to age seven, is called the Good Life because the traditional and historical perspective of children has always been that children are the most important, they're at the centre of that circle. Everything revolves around the children. Everyone has responsibility to them. And they, you know, are cared for, nurtured. And all of that is done to support that child in, you know, developing the sense of who they are and their identity.

And so there was lots of, you know traditions, and ceremonies and celebrations for the child. Particularly during those first seven years of life. Because it is the - supporting the foundation for that child to, you know, further on in their development into adolescence, and into adulthood and elder-hood.

## Rutter – responding (2:27)
Coping & competence - 1.2 Individual differences

Well I think the most important thing is forming relationships with the children. Now obviously as a caregiver or professional of some kind is different from being a parent or a grandparent, but relationships are such a crucial part of growing up that that's important. One aspect of that is the recognition that children are different. And that what suits one child won't necessarily suit another and an important part of being a good caregiver is a recognition of responding to each individual child. Responding in the sense of needs but also responding to what makes them interesting. Of being able to have fun with the children and that even when one's involved with teaching or discipline or whatever, nevertheless, good humour, fun, is an important part of that.

And recognition that the idea of experiences impinging on a passive child is really just not the way it works. Even babies process their experiences. They think about what's happening to them, they draw their own conclusions and so that one needs to get away from the notion of stimulating children to a notion of children being active partners in this, and your job, as it were, is to bring that out, to make it fun, to engage their curiosity. And to recognize that children who ask awkward questions are actually learning. And that one needs to be able to respond to that. What one does not want is simply a compliant child. You want a well-behaved child of course but you also want one who's provocative.

## Santos – experience (2:28)

Brain development - 1.2 Experience-based brain development

We've learned more in the last 30 years about what's happening in those early years of development than we ever knew in the preceding 2500 years. So most of that research is new and has only been recently begun to be applied to thinking. In terms of what happening in there – it really starts from conception. Often we think about children after they have been born and we often need to remind ourselves that so much happens in the prenatal period during pregnancy. In terms of how we support kids it really needs to start in supporting parents and pregnant moms especially. In terms of what's happening developmentally, the story of how the brain develops I think has really captured the imagination of the public and everybody who has been working on this today …

The thing you refer to as sculpting is a metaphor for what happens at the level of the neurons in the brain, and like most of the rest of living beings in the world, human beings at birth  their brains are not fully developed.  After a child is born much is still required to help that baby's develop in a way that will increase that child's life chances and potential.

Experience based learning is heavily dependent on the social environment of the child. So in addition to the things that we think of as given  a child needs enough food and water, a warm and physical safety  the way the brain develops in the early years is heavily dependent on the presence of nurturing relationships, or the presence of a caring adult in the child's life, such that they talk about the sculpting, the connections in the child's brain, really depends on that interaction. So it is really incumbent on us, from that research perspective, to consider how best to support that happening.

I do want to mention that there has often been a lot of talk about the early years being a sensitive period or a critical period of development. And while that's true a mistake that's often made is that it all ends, the chances end all before kids enter school. Which is not the case.

If you look across the life span course, from when a child is conceived through their life into adulthood, the most enormous point of activity is brain development is in the early years - there is another peak in early adolescence which is another discussion

## Santos – importance of caregiving (2:20)

Brain development - 3 Practices for healthy brain development

Although a baby is born with all the neurons in the brain that an adult has, about a hundred billion, sort of like the number of stars in the milky way is a way of thinking how complex the brain is most of those neurons are not well connected, hence they are dependent on the experience of the child in the first few years and pregnancy period. When you look at pictures of the brain at that level you see those connections happening through those early years. You find that, at around that age two and three probably you looked at from a developmental perspective, that's the time that there is the most connections in the brain because the child's brain is so active.  In fact, if you define being smart as the ability to learn new things, babies far and away out pace adults in terms of their ability to learn.  They are literally geniuses in terms of the way they approach the world.

Another thing we've learned about those early years is that it used to be assumed that babies were born as blank slates, they don't know very much, they didn't do very much, they just sat there, cried every now and then, and then you feed them.  The truth is with the new research is that babies are born with already an enormous amount of knowledge of how the world works and how it is organized and how to live in the world.  What they rely on caring adults for is to help shape that learning further in all domains of development, their social development, emotionally and in terms of their learning ability, so that sculpting that occurs really depends on that interaction in every way with caring adults, whether that's playing, talking or reading or any number of ways that adults typically interact when they encounter a child.

We find is that there has been a lot of worry on the part of parents and adults that care for children as to what you do with these babies and how best to maximize their development. When, in fact, the kinds of things that I think the research shows that most  adults unconsciously do when they're around children, which is to pick them up and cuddle them and play with them and talk to them in baby talk and all that. All of those things that we sort of unconsciously do are in fact some of the best things we can do with a child. You don't need any special toys or books, with apologies to the people who sell those things. What you need is a caring adult with a consistent time, space and opportunity to be in the life of the child in that important period.

## Shanker – caregivers (2:06)

Brain development - 1 Early brain development

However, nature had one more ace up its sleeve. Nature, since it was giving birth to these brains that were so small and undeveloped at birth, could also use the opportunity to make our brain highly adaptable. We are the most adaptable species. The infant's brain can adapt to anything from the Arctic to the Sahara, to a very safe and secure environment to a very hazardous environment. The connections that are formed in the first two years of life are molded by the kinds of experiences that that child encounters. And the primary vehicle for these experiences are the caregivers. This is a defenseless creature that relies on its caregiver for security, food and learning, and stimulation. And so what we find is, that beginning at birth, through the caregiver's facial expressions, through the gleam in their eyes, they are stimulating and regulating how that little baby's brain develops. What sorts of connections develop?

We know that there's an enormous explosion of the growth of the synapses, of synaptic genesis in the first eight months. At that point we know that a significant process of pruning starts to occur. Those connections that are turning out to be most useful are the ones that will be kept, that will be preserved, that will serve as the sort of foundation for the growing architecture of the brain. Again, these connections come through the primary caregivers. They serve as the sort of conduit--the lens--that introduces the child to the world. Their gestures, their facial expressions indicate to the child: this is interesting, this is new, this is frightening, this is to be avoided.

## Shanker – evolution (2:58)

Brain development - 1 Early brain development

One of the questions that we wanted to understand from very early on, is why is the parent, why are the primary caregivers, so important to this whole process of early brain development? And to answer that we began to actually study evolution. We studied this very closely. And there is a growing awareness in the neuro-scientific community that looks at the evolution of the human brain. That nature was confronted with a very interesting dilemma when it was evolving the human brain. On the one hand, it discovered that bipedalism, the ability to walk on two legs, gave humans a wonderful advantage over all other species.

On the other hand, it was discovering that a big brain gave us another wonderful advantage in terms of our ability to plan, to remember, to project. This created a dilemma, and the dilemma was how big a brain could nature evolve, while still enabling our females to walk on two legs. Because they had to give birth to this big brain thing.

Nature came up with a very interesting solution. It had us give birth to our babies, in essence, prematurely. Our babies, to quote what Stephen J. Gould said, are "fetuses outside of the womb" for the first nine months of life. So they are born with approximately one quarter the size of their adult brain. Now, nature had to ensure that these babies would receive the appropriate kinds of experience that are necessary for the developing architecture of this emerging brain.

So, what nature did was, it gave us all sorts of mechanisms that ensured that the primary caregiver, usually the birth mother, would stay in close proximity with her infant. And so we have things like certain hormones that are actually released by the baby crawling up the mother's ventrum immediately after birth to search for milk which it does by its olfactory sense. And when we study this we see that it releases oxytocin in the mother, the so-called cuddle hormone. It also stimulates GI hormones. It also does things to the baby's brain.

So we have these mechanisms, that are largely innate, that ensure that we will have this kind of close caregiver-infant relationship for the first couple of years, which is the period during which the child's brain goes through this enormous burst of development.

## Shanker – example of self-regulation (4:39)

Coping & competence - 1.1 Self-regulation

Self-regulation is the story about how much gas a child has in their tank, and what are the things that a child is using up their gas on? The way we started to think about this I put my car in cruise control, and I noticed that I was burning about 8 liters per 100 kilometers, when I was on a flat surface, and then the car had to go up a hill and I suddenly jumped from 8 liters per 100 to 40 liters per 100, and then as I went down the decline it went down to 3. And I realized that, you know, we have this assumption that every child is sort of, you know, they're on a level footing, they're all, you know, if they're not paying attention, if they're not paying attention it's because they're not trying.

Well, I'll give you the perfect example, and then I'll explain its significance for all children. I was in a classroom, I'd been asked to come in, and I'd been asked by the school because the school had a little girl in this class, she was a 9 year old, and she, the school, this child, the child was hyperactive, and the school wanted her placed on a stimulant and the parents were resisting. And the parents were resisting because they had read up about possible side effects etc., sleep problems, aggression, and so really what the school wanted was for me to convince mom and dad that the child should be placed on a stimulant. So, when I came into the class the little girl was sitting in the front row to my right, and I ignored her for about the first 5 minutes, thinking that I could demonstrate how easy it was to control this child's behavior by inhibiting it, and of course it didn't work.

And so finally I turned to her and I said "Yes, sweetheart something seems to be bothering you, what's the problem?" and she said to me: "Sir, sir, sir, I can't hear you because of the noise from the fan". So I looked around and there was no fan on the ceiling, but what there was was an air intake vent, you know, fresh air intake vent, and it was making a slight noise. But this little girl had such hypersensitive auditory processing, that she had to work very hard to block out the distraction from the ceiling fan, from the vent. And she was using up so much energy trying to concentrate on me, trying to inhibit a distraction, that she couldn't control her behavior. And what it told us was she was just like my car going up the incline, this little girl was burning 40 liters per 100. I can have two children sitting beside each other, and I've got one kid who's ticking along at 8 kilometers, you know, 8 liters per 100, and guess what? Teachers love that kid. That's the kid that, that's the kid that we're going to smile at, you know it's all unconscious, we're going to smile at him, we're going to encourage him, we're going to say: "Good boy, you did it again!" and then I've got the little girl who's burning 40, and we find it annoying, we find it annoying when this little kid is bouncing around. Unfortunately our behavior is now going to make everything worse because of the stuff I was explaining before. The more we arouse negative emotions in that child, the greater the strain becomes on the child, everything is getting worse now, when really all it was was a case where this little girl was working way harder than the little boy beside her. When you think about stressors, we tend to think of you know, like, what kinds of stress could a child have, but we now know, we have tons of research now showing us that the stress on a child; it might be environmental, it might be familial, it might be biological, it might be the stress of finding bright lights or loud noises, or noises, or just the presence of other children requires an enormous amount of energy in order to inhibit these distractions. The key

for these children is under no circumstances do we want to be punitive with that child, do we want to try to control, discipline that child, shame that child, instead what we want to figure out is what are the loads on this kid and what can we do to mitigate them.

## Shanker – introduction self-regulation (1:57)
Coping & competence - 1.1 Self-regulation

The key to understanding self-regulation is that it is a capacity that develops post-natally, it's a capacity that develops essentially in the first five or six years of life, and it's for that reason, this is the critical reason why we are so concerned about the early years and about early child development.

So how does a child develop this capacity to self-regulate?  The short answer is that a child develops the capacity to self-regulate by being regulated. A child is engaged in almost non-stop interactions with their primary caregivers in the early years of life, and the caregiver serves as a sort of external brain who is regulating the child, whose brain is still quite immature, quite undeveloped, and exploding in the early years, and the caregiver has to perform this regulatory function for the child because those systems of the brain are only slowly developing in the early years, and it's through these constant back and forth interactions with their primary caregivers that the child begins to develop the capacity to do if for herself.

The child begins by being regulated to self-regulate, the way it happens is that the necessary information is being delivered into the parts of the brain that are coming online in the early years of life, so for example, the dorsal lateral prefrontal cortex which Adele Diamond studies so carefully, we know that this goes through a massive growth spurt between ages of three and five, but it's essential that during those ages the child is engaging in regulating experiences in order to deliver the necessary information to this maturating brain system so that the child can begin to take this over for themselves.

## Shanker – Self-regulation method (3:17)
Coping & competence - 3.1 Understanding feelings and behaviour

There are five elements and the five elements are reframing behaviour, so everything you and I have talked about. Distinguishing, for example, between misbehaviour and stress behaviour, between oppositional defiance and what we call 'angstbeisser' which is what a cornered animal does when they're threatened. So we have all these distinctions and they're very important and reframing ourselves, reframing my own impulses, reframing my own- recognizing that these distinctions that we're drawing for children are every bit as relevant for ourselves or whoever.

The second step is recognizing the stresses. And really what we mean here is deepening our understanding of not just overt stresses but hidden stresses and often it's a sort of tandem exercise between reframing and recognizing. The better you get at reframing, the more you start to recognize. The better you recognize, the more you reframe also.

Then we talk in the third step about reducing stress and so there are many, many ways of doing that. To give you a very simple example, if a child is finding it very stressful in a noisy classroom and this is one of our major stresses for little guys, there are very simple techniques for reducing the stress. We have used headphones, earplugs, a quiet area in the classroom, a quiet area in the hall. So there is all kinds of ways of reducing stress once you actually know what the stresses are and here we emphasize that every single child is different. And equally, so what's stress for one child may not be for another.

Then the next step is we talk about reflecting and really what we want the child to learn is we want them to develop their awareness not just of when they're over-stressed. We want them to learn to recognize when they're becoming over-stressed, when they're getting close to that point of being over-stressed in order for self-regulation, the last step, to be really successful. The last step is responding. In order for the fifth step to be really successful, it's very hard to do much when you've gone past your point, when you've lost control or whatever, when you've had a meltdown. I mean think about the toddler who's had a meltdown. There's not much you can do at this point other than just soothe them. Is it possible to actually get a toddler to understand when they are approaching that point? Yes it is. Well if I can do it with a toddler, I can do with a teenager.

## Soderstrom – message for parents (1:23)

Communicating & Learning - 1.1 Acquiring language

I think that the take-home message is that infant-directed speech or kind of the funny way that we talk to babies is definitely not bad. You know, sometimes there's a message that gets out there that you shouldn't talk baby talk to babies and I don't think the literature supports that perspective. There's a lot of good reason to believe that these characteristics and how we talk to babies are important. And there's a robust literature supporting the idea that the more babies get in terms of language input, especially sort of that one-on-one kind of interactive experience, is tied to language development.

So it does make a difference. But I always temper that a little bit with this knowledge that there are differences – there's individual differences and there's cultural differences in how we interact with babies and I would never want a mother to feel that you know, oh I must talk – I must engage with my baby all the time or I'm harming my baby. It's just something like anything in parenting that you know, it's good to interact with your baby, it's good to turn the television off. You know, it's good to read to your baby, but you don't want to make parents feel like they're – you know, they must be on all the time for their babies. People are real human beings. They live their lives and there's - every family has its own style.

## Soderstrom – recording studies (2:20)

Communicating & Learning - 2.1 Early language development

Over the last ten years there's been a sort of a technology shift that has occurred that has changed the way that we think about understanding the language environment of infants. So in the past when we were studying what babies hear in terms of the speech input that they get, we would go into somebody's home or they would come into the lab and we would record them going about as natural an experience as they can for, you know, an hour or something. And then we would take those back to the lab and you know, transcribe them or analyze them acoustically or something like that. But what happened about ten years ago now, little bit more, was the emergence of technology that would allow us to get a full day's audio recording in people's homes and then do some fairly automated analysis because you know, even getting a ten-hour recording isn't really that helpful if you then have to transcribe ten hours because that takes a huge – that's a huge investment. It could take as many as 20 hours to analyze, you know, an hour of recording or more depending on what you're doing with it.

So the development of, you know, better recording technology but also sort of more automated ways of processing the recordings has really expanded our ability to get a real window into infants' real-world language experiences rather than this one hour snapshot where the mom is really attending to the fact that she's in front of an audio or video recorder. Families can really go about their regular day and there really is some reason to believe that although they're not unaware that they're being recorded that they really can get to the point of being comfortable and really getting a real-world snapshot of those experiences. And one of the things that this allows us to do is then to compare different families both within certain communities and across communities and look at the variability both within communities and across communities in how – what are those experiences that infants have. And that can really be important for informing our theory about what is the relationship between what infants are hearing and what they're understanding about language.

## Soderstrom – studying infant language preferences (3:46)
Communicating & Learning - 2.1 Early language development

My name is Melanie Soderstrom. I'm an associate professor here at the University of Manitoba in the department of psychology and I run the baby language lab which is an experimental research lab with infants where we look at how babies learn their first language.

We bring babies into the lab and we play speech sounds for them and then we measure their interest in what they're listening to and we use that to learn about what they understand about language, what they prefer about language.

The first study uses a method called the head-turn preference procedure and the idea with the head-turn preference procedure is that we associate the speech sounds with a visual stimulus, just a visual display. And in the old days that was actually a flashing light. Now we do it-usually do it with video screens and so it's a flashing circle that changes to a checkerboard pattern. And it's just a way of measuring what the baby is interested in listening to.

So if they turn their head the speech sound plays. If they turn their head away after a certain amount of time the speech sound stops. And the babies learn really quickly that they can control what they're listening to.

So the baby comes into the lab. They're seated on the mom's lap. The mom is wearing a set of headphones that play kind of a weird mix of music and speech to try and mask what's being played so that they don't accidentally influence the baby's behaviour. And that's really important. And then the experimenter is in another room so they also can't hear what's being played and again bias things. And then when the baby's looking forward the screen on the side comes on. The baby looks to the side and then it changes to the checkerboard and we play the speech and like I said, as long as they're looking towards the screen the sound plays and if they look away the sound stops.

So the longer that they look towards the screens the more interested they are and so we can compare different types of speech. So in this particular study, we're looking at baby's interest in something called infant-directed speech. So the way that we talk to babies that's different from the way that we talk to adults.

It's been known for a number of decades that we speak differently to babies than to adults. And so there's been a lot of research looking at the different properties, the fact that we use a higher pitch and a more variable pitch, the fact that we speak more slowly and with more of a happy, positive affect and a number of other characteristics. And there's a lot of research supporting the idea that this is actually beneficial for babies in learning language. And then together with that, there's also a growing body of research that shows that babies prefer to listen to speech that's in that style versus in the adult-directed style which is kind of more monotone and longer sentences and things like that.

So they're hearing speech that's in this infant-directed speech mode and other speech that's more directed at an adult and we look to see whether they prefer the speech sounds in infant-directed speech over adult-directed speech.

In this particular study, the speech they're hearing is Norwegian because we're also looking at differences across languages and language communities in infants' preference.

We're measuring the length of the looking time on a given trial and if that looking time is longer then we interpret that to mean that the baby prefers that speech stimulus than if they look for a shorter period of time. But obviously, we can't get into the baby's head and this is an inference that we're making. This is one of the things that makes research with infants much different from with adults or even certain aged children where you can actually ask them, "hey, do you like this or do you not like this?" We have to make these inferences based on their behaviour and what can babies do. They can suck on things, they can look at things, they can grab for things. So those are the things that we measure.

**Soderstrom – studying the impact of SES on language development (3:23)**
Communicating & Learning - 2.1 Early language development

So, there was this original study called Hart and Risley. That was the authors' names. So the Hart and Risley study was ground-breaking in a sense that it was looking at the impact of socioeconomic status on the language experiences of infants.  And the original finding was that there were differences in the quantity and the type of language exposure that infants from different socioeconomic backgrounds were exposed to and this was correlated with differences in their vocabulary development. And so this was calculated and the term was coined the 30 million word gap and its had quite an impact in our thinking about how to address social disparities. And so that was done with the research methods of the time and in fact, it was somewhat ground-breaking. I think sometimes people underestimate the amount of effort that was put into painstakingly hand transcribing all of those many hours of recording and so, you know, sometimes people criticize it was a small sample but gosh, there was years of effort that went into producing that result.

So that was kind of a seminal finding. Since then there's been quite a lot of research looking at the impact of socioeconomic status on the experiences and the language development of infants and there's a general consensus that there is an impact of socioeconomic status. What is driving that is, of course, the question. And so more recently there's been a debate that's emerged in the field around how we characterize and how we understand the nature of children's language experiences.

So one of the things that's kind of this thing that we're trying to resolve is that on the one hand, you have this very robust set of findings about differences across socioeconomic status. On the other, you have these very strong cross-cultural differences in what's considered sort of normative behaviour between mothers and infants. And we know of communities around the world where the idea of spending time talking directly to your children has, you know, that's just - it's very different. There's the – if you measure it there's just very little actual directed speech in these sort of one-on-one context. And at the current state of our understanding of these things there doesn't appear to be any reason to believe that those – children from those communities are disadvantaged when it comes to language development.

So, on the one hand, we have this robust literature that says that the amount of speech and the quality of the speech that you hear is directly tied to your vocabulary development and measures of language development. On the other we have these massive cross-cultural differences in the quantity and the types of speech that infants are exposed to and bringing those two literatures, these two robust literatures and understandings together in a way that paints a coherent picture, we're just not there yet.

## Sokolowski - gene (1:33)

Brain development - 1.1 Brain architecture

A gene is a very long piece of DNA, so each of our chromosomes have long pieces of DNA, like a very, very, very long hair and it gets wrapped up together and that's our chromosome. And when we look, stretch out that long piece of DNA and divide it up, there's genes that are made of that DNA, so at one part of that long hair is the beginning of the gene, and one is the end of the gene. So the gene is a piece of our DNA and they're along this hair like beads on a string, and each of our chromosomes have a series of genes that are on them. And those genes may encode for, may contribute to differences in eye colour, differences in whether you have a hitchhiker's thumb or not, I don't, you can look at your thumb, some of them bend back a little more. Whether your earlobes are attached or not, whether you can roll your tongue, which I can, others can't. And so these genes can influence variation in those traits, and so you may have a gene that influences one of those traits, like whether you can roll your tongue or not, and that's one gene that is encoding tongue rolling, and one person may have one variant or one form of the gene, which is to roll your tongue, and one another may have the other variant of the gene, which is to not roll your tongue. And so for traits like that, the gene in a way determines the outcome, but for most other traits: behavioural traits, developmental traits, there is not a one-to-one relationship between the gene and the trait.

## Sokolowski – nature vs. nurture controversy  (1:52)

Brain development - 1.2 Experience-based brain development

So now we know that it is not nature alone, and it is not nurture alone, and we can't even add them together and say, "well it's 30% nature and it's 70% nurture" that is also wrong. What it is, it's an interaction between nature and nurture, and interaction between genes and the environment, and that's an interplay between the genes and the environment, and I'll talk to you more about how the environment, the genes are listening to the environment, and that's what we mean by epigenetics - the genes are listening to what the environment is doing. And as a result of that listening more or less protein is made.

So, one thing that we need to wipe out of our thinking is deterministic thinking. We don't talk about a gene for this, or a gene for that, and if you read in the paper that there's a gene for being violent, someone has quoted the scientist wrong, or the scientist was describing their research wrongly, and the work that we've done in my lab really shows that even in the cases where we have a single gene, we've identified it, we cloned it, we know there's two DNA variants, it predisposes animals to behave differently, all we have to do is alter the early environment of those animals and we completely change the gene expression, and also the behavior.

So the allelic variation does not have a fixed effect in any way on the phenotype, and we can also go in later in life and boost up the gene expression in animals, and cure, or if you like- or restore the more normal behavior or that level of behavior, so that's what the common, modern day way of thinking, it's about gene-by environment interactions, the nature/nurture controversy is dead.

## Sparling – conversational reading (2:08)
Communicating & learning - 3.3 Creating curriculum

Conversational reading is a form of reading to children and one, again, this is done on a very individualized basis. With children under age three it's done one on one; the teacher sits down with one child and reads a book. She reads a book individually to every child every day. And often teachers who are doing this well will in fact read several books to each child every day and if you're working with children that are age three and four you read books in pairs, so you read to pairs of children and you have a special technique that you use in reading called the three S strategy, and the three S's are see, show, and say. The teacher tries to get the child to see the things on the page, the child is responding to the teacher's request to look at a certain thing, and the teacher's checking does the child look at that thing? And then show, you're trying to ask the child a question and the child gives you the answer by showing something on the page, by touching, pointing, covering, tickle, sometimes we say "tickle the monkeys toes," or "cover the tiger there on the page, and then by saying, and there we ask the child "what's this person doing" "who's this" and we ask things like "can you tell me what's going to happen next" so we're getting verbal answers.

What's important about this is this reaches right down to the tiniest babies up to quite advance four and five year olds when they're giving a whole paragraph answer and the very young child is simply giving a look or a point and teachers learn to be very skillful in understanding all these child behaviours and it makes conversational reading quite different from different kinds of reading because it reaches right down to very young children and those young children give meaningful responses on every page. The teacher does something, the child does something. The teacher does something, the child does something.

## Sparling – educational program (1:03)

Ecology of childhood - 2.3 Early intervention

We believe that the results of this study, especially the first Abecedarian study and the big one we did on low birth weight children are the results of the educational program. That is the elements I talked to you about what happens in daycare. The reason we believe that is because we were careful for the kids who didn't get into the program, the ones who were in the control group, to see that they had good health care, to see that they had good social services to make sure that they got nutritional supplements for example during the first years of life such as iron fortified formula and so forth. Those elements that we tried to equalize out across the two groups, and that really makes us believe that the effect was much more reasonably associated with the educational program.

## Sparling – enhanced caregiving (2:32)
Communicating & learning - 3.3 Creating curriculum

The third element of the Abecedarian approach is enriched caregiving. Enriched caregiving is something that most people do intuitively, but we're bringing this to a higher level of consciousness and a higher level of intentionality and a greater frequency in terms of interactions. Enriched care giving is the care act, whatever you're doing – changing diapers, providing food, taking the coat off, combined with some teaching content, and those two things: care plus some educational content equals enriched caregiving.

Many people do this intuitively, but people who use the Abecedarian approach do it very purposefully and they do it frequently; they do a lot of this kind of talk and a lot of this kind of interaction. You talk about the colour of the coat as you're putting it on, you count the sleeves, you talk about the process of zipping the zipper; the zipper is going up, up, up, and you talk about the food, you name the food and the textures and you ask questions about the shape of the bowl. I was just doing a training today and teachers were asking questions about, they were talking about "let's count the spoons on the table," and they counted the spoons and they counted the forks and then they said "oh, spoons and forks together, are utensils, oh, how many utensils are there?"

So they are doing this right in the process of caregiving, and it's really interesting. I've talked to people who have used this and they say far from making my job more work for me, this makes my job easier because the kids are more engaged and they're more happier and so forth, and so they're learning at all times. Kids always learn during care giving, but they may only be learning that the adult just wants me to hurry up and finish my meal, or get that coat on quick, but they can learn good things and important educational content and the importance of enriched caregiving is that there is so much time that necessarily is taken to caregiving, and the way we make our program strong and powerful is by linking our education and our care, and our care carries the education forward. I often say there's no extra time needed. You were going to use that time anyway for caregiving, so you just add that extra component of education to it.

## Sparling – follow-up (1:35)

Ecology of childhood - 2.3 Early intervention

There were 111 children in the original Abecedarian project. By the way, there have been a series of randomized studies, actually 15 different randomized samples since the first one. But the first 111 children, about fifty something in each group, were randomized at birth and we did our intervention throughout the first five years of life, and then we continued to measure after that. For example, after measuring across five years of life, we measured at age eight and then at age 15, and then at 21, and now we've measured at age 30, those results have just been published, and lo and behold this coming summer, the summer of 2012, our first child will reach 40, so we are now planning the age 40 follow up, and there have been over 200 journal articles and juried journals published on this group of, these children in the original group and the other groups that followed it.

I should say, too, that we're still following about 95 per cent of that original group at age 30. That is really a remarkable retention rate and we've worked really hard at that, but we've also been very lucky in doing that

## Sparling – health findings (1:56)

Ecology of childhood - 2.3 Early intervention

One of the unexpected findings of the Abecedarian program is that when we measured at age 21, there were a variety of health outcomes. Children were healthier, they were less likely, oh, no, they weren't children anymore, they were young adults. They were less likely to have symptoms of depression.

They were more likely to have a healthy diet and a healthy lifestyle. They were less likely to use drugs and they had less risky behaviours. Now that was not something that we targeted, but I think what it shows is that if your life is going better in general, if you're succeeding in school, if you manage to go to university or a substantial proportion goes to university, then the odds of your taking care of your health, of having better health outcomes just increase. It was kind of an indirect effect and we're rather intrigued by that. When we study at age 40, we're going to look especially to further health effects because many of the groups we've studied have predicted poor health outcomes as they age, and so we think that may not be so true for this group.

There has been one economic analysis happen of the Abecedarian program and it basically shows that for every, when we measure at about age 21, for every dollar spent there's about a four dollar return to society, and that, by the way, is largely from the educational effect. We haven't even begun to get the health effects of that so when we go further out to older ages, it's very likely that those numbers will go up in terms of the return on your investment.

## Sparling – introduction to Abecedarian (2:23)

Ecology of childhood - 2.3 Early intervention

The Abecedarian project began in 1972, and at that time we were trying to scientifically determine if we could make the prediction that poor children and disadvantaged children would not do well in school not be true; make that prediction not happen. And, in fact, that is what we found. We could take children that by all previous experience not done well in school improve their school performance to a very substantial degree and have them have a better outcome both in school and in life.

The key components are educational components. Now, we believe that any program needs to have good health care and good social services and good transportation surrounding it, and Abecedarian had all those. But the key components are childcare, full time childcare year round, fifty weeks a year, and that has a certain set of characteristics. Those characteristics is that it uses learning games, it uses conversational reading, and it uses enriched care giving, and within all those three elements it uses a language priority. That is it focuses first and foremost on language as the most important thing that we do as early childhood people.

Abecedarian is an ordinary English language word, it comes from Latin and it means someone who is learning the rudiments, someone who's learning the basics. It's kind of a fun word. When I was a second grade teacher I used to use the word abecedarian on the first day of school and write on the board I am an abecedarian, I am someone who's learning the basics. And by the way, if you say kids, look at that word, what do you see about it, they see it has a b c d at the beginning, and that's no accident. The word has been created to refer to the alphabet, so it refers to the alphabet or someone who is learning the rudiments, but I want to be sure that I say that we don't necessarily teach the alphabet, it's just the alphabet is a metaphor for the basics, the building blocks.

**Sparling – learning games (3:12)**
Communicating & learning - 3.3 Creating curriculum

Learning games is a set of 200 activities and beginning in the 1970s we tested out all of these activities individually to see if they would work, see if they would produce change in children, see if teachers liked them, see if children would respond to them, and those have been written up and teachers use these like a cafeteria of ideas that they choose for each child so that each child has a little plan and this particular week he's working on these two learning games and next week he's still on those two but he's added a third one and so forth and so forth. So that each teacher's planned individually for each child and you would see during the day many things that would be quite familiar. You'd see circle time and you'd see centers and so forth, but you would see the teacher kind of settling in with one child at a time or sometimes just two children at a time, usually no larger than that, and taking a short period of time with tiny babies that might be only thirty seconds or two minutes, in an older child it might be five minutes, and those little episodes become key moments in the day that have what I call powerful teaching, special learning habits during that time and it supplements all of the other free play and social interaction and so forth that happens.

There are three basic kinds of learning games. The first is the kind that you enter in progress play. You wait until you see something happening in the child's play, and then you say ah, that relates to a certain learning game I have in mind, and you join that play and you add some value to that child's play.

The second kind is the kind where you have something in mind, but it's not likely to happen during the day, and so you invite the child into play, "come and play a game with me." And of course you always look for a time when the child is not super busy with something else, and so you're not interrupting something. And the third kind are games that are seamlessly incorporated into care giving. In fact, the person who wouldn't know much about learning games would hardly be able to notice most of these games. The teacher is doing certain things, but they've done it so seamlessly within the day that it doesn't appear planful, but in fact it is on the teacher's part.

You might have a particular way that you are going to do a little copying of structure. Sometimes you use duplicate blocks. The teacher gets some blocks just like the child and you might just see a teacher sit down by a child and say "oh, I want to build a tower like yours," and you wouldn't even realize that that was a game that she had actually intended to do ahead of time when that opportunity came up.

## Sparling – outcomes (2:48)

Ecology of childhood - 2.3 Early intervention

The Abecedarian studies have over the years taken IQ as one of the important measures that we did. It's not that we believe that IQ is such an important variable over other variables, but it's known to relate very well, very strongly to school success. If you manage to be a little smarter, you're likely to do a little better, and it's kind of a measure that predicts how kids are going to do in school and in life, and we have been able to see for example in the very first study and in the study I mentioned for you about the low birth weight babies that the IQs of the children in the experimental control group diverge rather quickly and between 18 months and 24 months, somewhere in that period of time, the two groups become significantly different so that one group has an IQ advantage over the other, and by age three, the difference is quiet large, quiet striking. Now in the groups that we have followed for a long period of time, such as the original Abecedarian group, when we measured IQ at age 21, which is the last time we measured it, we still had a significant difference. By that time, it had been about a 15 point IQ difference, it was only about five points by that time. The groups has kind of merged together, but the difference between five IQ points meant the difference in terms of going to university of a 23 per cent graduation rate for the experimental group and a six per cent graduation rate for the control group. In other words, a fourfold increase.

Now, what's interesting about this, remember this is a very at risk group. 23 per cent graduation rate is what Canada has for the general population. University, yes. 23 per cent University graduation is what Canada has for the general population. It's what the United States has for the general population. It's what Australia happens to have for the general…this is a very at risk group, and that's their graduation rate. It just shows that just because you were disadvantaged; you came from a poor family or poor neighbourhood, you don't have to do worse than the general population, and I think that's very good news. It shows that early childhood can have a lasting effect, not a small and temporary effect.

## Stanley – nurturing (3:18)

Brain development - 1 Early brain development

Well this is where I think it's very exciting because we now know more about brain development and child development than we ever have. Of course we used to have it intuitively. When I talk to some of our Aboriginal researchers and colleagues, the equivalent of your First Nations people, they say, "Why are you researching this? We've know about this for 40,000 years." And my answer to them is: We seem to have forgotten it. We seem to have forgotten how important those early years are to develop the knowledge and capacity to interact with peers, to have a capacity to understand your environment and to be able to be competent within it. And to actually have these wonderful social interactions that enable you to be an intellectually and socially competent person. We have forgotten how important those early times are. When you think about it, it's logical. It's so logical.

But what's been very important and exciting is the neuroscience research, the brain research, which has shown how incredibly important the brain development is, both in utero, in the womb, and in those first three, four, five years of life. While there's obviously quite an important genetic component for the big picture of what a brain looks like, we all have cerebellums, we all have a cortex, we all have an amygdala, we all have a temporal cortex and so on. But how those parts of the brain work together and actually become competent in utero, in those first few years, are due to those social environments around a child. It's that sensory input; it's about how these peers, these parents, these environments around that child; auditory, visual but also the ones that turn on the frontal cortex, particularly the nurturing environments, the appropriate response to crying, the breast feeding, the reading to the child, the talking, the really stupid things you say to a child, which is in fact developing that child's understanding about how social interactions occur. And in fact we know now that that turns on specific neuro-endocrine pathways in the brain. It's wonderful stuff.

So that gives us a very strong message about the importance of these interactions and teaching parents about these interactions. They're not just inconsequential; they are vitally and centrally important to how that child will be at age 10, at age 20, and even at age 50 and 60. And so this now is where the solutions come in. That we have to provide for parents, for communities, for families, for governments, local, state, that's your province, and federal governments, this knowledge. Because the whole future capacity of that child, that family, that community, that nation, is dependent upon how effective it is that we turn on these pathways and make these brains connect properly. Exciting. Simple. Gorgeous.

## Stanley – understanding population data (2:33)

Developmental health - 2 Developmental health research

I think the understanding of population data by people who are working out there with families and children actually is important for several reasons. Firstly, it justifies what they are doing. Because they may think they are just working with one family and focusing on the children of that family, to actually put that child on a trajectory to good health. But in fact what is now coming out is a very powerful reason for doing early child intervention and early child development intervention is the powerful impact this is having not just on this individual family but on whole communities. And if you think about that, when you get whole communities that are performing better because the kinds of things that are enhancing family functioning are enhancing community functioning. Then that's a pathway to national development and prosperity. So it is actually very important that people who are working just one-on-one understand the power of this implementation for the effect on the population.

The other thing that I think is exciting for people who are working at the practice level is that it's from population data that we have actually worked out these pathways to resilience. It's actually by grouping together these population factors, these risk factors, these protective factors, looking at how children and families interact in a population sense that we get enough numbers to say Yes, these are important trends, this isn't just an isolated example of how this works in one family. We've actually got this from thousands and thousands of families and thousands and thousands of children. We've looked at how parenting practices, the kinds of parenting that you do, we've done that in thousands of families.

We've looked at trajectories of thousands of children with mental health problems and we've been able to go forwards by looking at these big large population databases to look at these trajectories in longitudinal data to mental health outcomes. We've been able to take case control studies where you take cases of children with mental health problems and controls of children who don't have those problems and work backwards through the population data to say What were the powerful influences and I think that's very important for people who are working in practice to know that this is very, very rich data that's informed what they're doing. So it isn't something that's not backed up by the strongest of evidence.

**Tremblay- early onset of aggression; aggression and preschool period  (3:14)**
Coping & competence - 2.3 Emotional learning

The Montreal longitudinal study helped us to understand that physical aggression is not something that starts during the elementary school years or during high school. Since they were at their peak in kindergarten and the frequency of behavior was decreasing as they grew older it forced us to start a study at birth to be able to understand the development of aggression during the preschool years. We've been following 2000 children from five months of age and they're now in kindergarten.

What we've been seeing is that from five months to approximately 24 months there is a rapid increase in the frequency of physical aggression; that the peak of physical aggression in terms of frequency is between age two and three, four years of age. And after that it starts decreasing. So that clearly, if there is learning of physical aggression it's starting very early but we believe that what we're seeing is that children do not have to learn to use physical aggression; this is a normal behavior early on and that the environment helps the child learn to use alternatives to physical aggression and this is why there is that early peak and then decrease of use of physical aggression throughout elementary school and adolescence.

We've also learned that there are children, although everybody does it at age two, there are some who use physical aggression more often than others and those are clearly more at risk of not learning alternatives. They need very good environments to be able to learn to put on the brakes. So that it's important for children during the first three, four years of life to have an environment that is helping learning alternatives to using physical aggression.

## Tremblay – intervention (2:45)

Coping & competence - 2.3 Emotional learning

There were two main parts to the intervention. One was parent training, where we were going to the homes of the parents for every three weeks for a period of two years. We were doing a standard parent training intervention where we trained the parents to observe the behavior of their child; observe when they were behaving positively and reinforcing that positive behavior; observe when they were misbehaving and helping them learn to give proper responses to misbehavior. And also training them in sort of general problem resolution skills.

At the same time we were going into the schools and we were getting these children once a week into a social skills training program. And that social skills training program involved being in a group of highly skilled boys that we had identified before. So we had approximately five or six highly skilled boys with two or three boys who had behavior problems so that the highly skilled boys were acting as models for these low performing boys. And we believe that this type of intervention managed to get the boys who tended to be rejected to learn the skills to be accepted by the boys who have less problems.

**Tremblay – Montreal longitudinal experimental study: study of aggression (3:47)**
Coping & competence - 2.3 Emotional learning

The Montreal longitudinal experimental study is a study of boys who were in kindergarten in low socio-economic areas of Montreal in the early 1980s. These boys are now 26 years old and we have assessed them almost yearly since they were in kindergarten. It's a sample of approximately 1000 boys. The aim of the study was to understand the development of children who are at risk of having serious problems during adolescence. That's why we chose boys and that's why we chose them in a large city and from low socio-economic areas. The study has focused on a large range of topics, but one of the main focus was how can we prevent children who are at risk when they enter kindergarten from having serious problems in elementary school and then through the adolescent years.

We have shown with this study that probably children are at their worst in terms of aggression, hyperactivity. If we start in kindergarten, they are at their worst in kindergarten and most children as they grow older tend to reduce the frequency of their problem behaviors. But if they don't substantially reduce that level of problem behavior then they get into more problems in terms of the reactions to their behavior because they're growing taller and stronger and people will not put up with an aggressive, physically aggressive 12-year old as they will put up with a five or six-year old aggressive child.

We did a prevention experiment with that study, so we gave parent training and social skills training to the at-risk children and the at-risk were of course those who showed most problems in kindergarten. And we've shown that an intervention, an intensive two-year intervention, with these highly disruptive boys in kindergarten, could reduce their level of problems later on. Those who received the intervention were more successful in school, they had friends who were more positive, less of them abandoned school before the end of high school and less of them had serious delinquency problems.

## Tremblay – play fighting; rough and tumble (2:06)

Coping & competence - 2.3 Emotional learning

Well, one of the most surprising findings that we are getting concerning the development of physical aggression is that play fighting is probably one of the best ways to learn alternatives to physical aggression. Play fighting is play and you can see that children are play fighting when they are laughing and having a lot of fun. You can see that they are not play fighting when they're crying that they've been hurt. So play fighting is a time where you are learning the limit between play and aggression. And if you are not play fighting it's hard to learn where are the differences. One of the best examples of play fighting is tickling. And if you've ever tickled someone, you may hurt that person the first time you do it. So you need to learn where the limit is, where it's fun and where it starts to be hurting the other person. And aggressive behaviors, if they are sort of in-built because we've needed them throughout evolution, there are behaviors that are fun. And that's why we see cats play fighting, and dogs play fight, and children spontaneously want to play fight. So having fun in doing these exercises, in playing, is a good way of learning alternatives to physical aggression.

## Warner– changing economic thinking (1:48)

Developmental health - 2.3 The economic impact

We have traditionally thought of child care as the private responsibility of families. And what's happening now is we're beginning to articulate child care as part of the public responsibility of society. And what makes early care and education a public as opposed to a private responsibility. And the link there is that we all are vested in the outcomes of early care and education. I want your children to be well prepared for school because that's good for me in the long term: it reduces crime, it increases school performance, it improves their labour force performance, and eventually they are going to be supporting my pensions in my old age.

So we've begun to take a longer, intergenerational view on the importance of children and realizing that they are, they have, child development has some public good aspects to it. We've long recognized the importance of kindergarten to 12th grade education. We've recognized the importance of higher education: colleges. And we give substantial subsidies to those pieces of the education framework. But we have not stepped up to the plate and given the kind of resources to early care and education that we need to do. And it turns those early foundational investments out that can yield even greater returns than the investments later in life. And so the societal value to this is in terms of employment, in terms of school readiness, in terms of reduced crime and other social ills. Children who get a good start in life tend to be launched better into adolescence and adulthood and that benefits us all.

## Warner – economic benefits (2:47)
Developmental health - 2.3 The economic impact

The economic rationale for investing in early child development stems from a number of factors and we like to think of child care, early care and education, as having a three-part impact on the economy. The first and most important impact is the impact on children's development: their social, emotional and cognitive development which makes them ready for school and then develops them to be more productive members of the work force later in life. And there's been a fair amount of research, particularly in the US looking at longitudinal studies that shows very high economic returns for investments in early care and education. That is sort of one-third of the picture; a very important piece.

The second economic rationale for investing in children, in early care and education, is the impact it has on parents. And parents' labour force mobilization, the career choices and career ladders, particularly for women. And in a time of labour shortage there's a lot of interest in the business community on how to motivate and maintain, particularly women in the labour force as they become mothers. It's also important for fathers but the particular issue we've been seeing in the US lately, in the last four or five years, is a slight ticking downwards in women's labour force participation after they have children and this is in part due to the inadequate social infrastructure of child care. So that's the second, and also very important reason, business case, for investing in early care and education.

The third reason, and the one that I focus on mostly in my research is the perspective, from the perspective of the region and the regional economy. And child care as it turns out, is a critical social infrastructure for economic development. And we've always considered physical infrastructures like roads and bridges and water and sewer lines as being important for economic development but we've ignored child care. And the business community is now keenly aware, because of problems with labour shortage and problems with retention of employees, that child care is an infrastructure. It's not something that business wants to have to provide itself. It wants it to be provided as part of the infrastructure that's provided at the community or the regional level.

So we've taken, in our work, we've taken the trillium flower as an example of these three pieces: the children's…the child development piece, the parent piece, and the regional economic piece. And you really need to think about all three together, in the whole picture.

## Warner – social benefits of early education (2:01)

Developmental health - 2.3 The economic impact

Traditionally we think of social welfare expenditures as negatives in national income accounts and we think of economic developments as positive: investments are positive, expenditures are negative. What's happening now with the new research on early care and education is a reinterpretation of those expenditures as investments, and this is a radical shift because when government or bus thinks about something as an expenditure, it's just money lost. But when you think of something as an investment, its money that yields a return. And it turns out that both in the short-, medium- and long-terms, early care and education investments yield a positive return.

And this is huge because as governments are stressed in terms of the amount of taxes they can raise and what kind of expenditures they feel they can handle, those things that are thought of as expenditures pure and simple are more likely to be cut. And programs and activities that are considered investment activities are things that you really need to do to for your short- and long term economic health.

So they are investments and we need to start talking about them in that way and thinking about finance vehicles that we use in other physical infrastructures. We don't have to pay for the full cost of a bridge today in order to build it. We know we can't wait and build it brick by brick over the next 20 years but we expect our children to wait. And while we wait in policy trying to figure out what to do they grow up without the care they need. When we need a bridge, we build it immediately: we finance it with long term financing. We build it immediately. We need to start thinking about an investment system in early care and education that acknowledges these highly positive long-term and short-term and medium returns and then goes ahead and builds it today.

## Werker – motherese (0:59)

Communicating & learning - 1.1 Acquiring language

Motherese refers to the way that we speak to infants and young children. Some of us have suggested that maybe it should be called parentese because it's not just mothers who do it. But what it refers to is the fact that we modify our voices as well as the style of speaking and, to some degree, the content of what we say when we're speaking to infants and young children. So for example, speech directed to young infants is usually higher in pitch; the vowels are elongated and it's quite musical in quality. As children get a little bit older, the pitch exaggeration isn't as great. So it's still high in pitch but not as high in pitch, to a little bit older infant or a young child. But the sentences are simplified and the choice of the vocabulary may be a little bit tailored to the developmental age of the child. So that's what motherese is.

## Werker – native language sensitivity (2:30)
Communicating & learning - 2.1 Early language development

Babies are born with perceptual sensitivities that prepare them for, among other things, learning language. And we know now from decades of research really, that when babies are first born they're sensitive to the individual sounds of the world's languages, they're sensitive to the rhythmical properties, to the stress patterns etc. And one of the remarkable changes that happens in the first weeks and months of life is that babies become more attuned to the properties of the native language, so they get better at discriminating the consonants and or vowels that are used in the native language. They get better at parsing, pulling multi work units in the native language in comparison to the unfamiliar language, and they get worse at doing these same things with nonnative speech.

What's interesting is this tuning to the sound properties and visual properties of the native language actually is important for later language acquisition. So as babies begin to learn words, they have to determine, or they have to be able to listen selectively to those sound differences that are going to be important and those that are not. So for example a baby learning English will need to treat different pronunciations of the word doll as all referring to the same object. So whether their mother says do you see this doll, or this is our doll, both of which change the character of that initial d, the English learning child needs to treat those pronunciations of doll as the same word, and hence learn how that refers to a particular object, whereas a baby in a Hindi learning environment, the d that would follow the s in this doll is a little bit different than the d that would follow the r in our doll. One of those is a dental d and one of those is a retroflex d, and those refer to two different words, those are two different words in Hindi, so the Hindi learning child needs to pay attention to that difference because it allows them to learn different words.

## Werker – newborn communication (2:46)

Communicating & learning - 1.1 Acquiring language

Newborn infants are prepared in a number of ways for acquiring language. I wouldn't say that they really speak yet, at birth. They have some vocal repertoire, primarily crying and vegetative sounds. Some people say, and there's some research to suggest, that those ultimately turn into the vowels and consonants of language. But what newborns do have is wonderful skills for listening to language. They seem to have been prepared both by biology and by prenatal experience for listening to the mother's voice and to the sounds and rhythmical characteristics of the native language.

So at birth, newborn infants show a preference for their mother's speech; their mother's voice over other female voices. They show a preference for language samples with the rhythmical properties of their native language versus an unfamiliar language. So for example, an English-exposed newborn will prefer listening to English and German and other languages with that kind of rhythm over languages like Spanish and Japanese that have different timing characteristics.

Newborn infants also show a number of other biases and preferences that are harder to explain on the basis of prenatal experience. They show a preference for listening to speech over non-speech. They show a preference for, or an ability to discriminate words that will ultimately carry meaning versus words that will ultimately carry structure in language. So content versus function words have different characteristics. Nouns, verbs, adjectives–words like dog, run, pretty; they treat as different than words, function words, that will ultimately carry structure like with, the, of. And they discriminate those two classes of words categorically.

So the set of abilities, some of which are probably given, as I said, by biology or an interaction between biology and prenatal experience and some of which are completely tailored from prenatal listening experience, prepare the newborn infant, at birth, to listen to speech over other types of sounds, to listen to their mother's voice, to listen to and pick out members of their linguistic community, and to begin to classify those words that they're hearing into the two big categories that will ultimately be necessary to put together meaning and grammar in acquiring a language. So they're pretty well prepared at birth for acquiring language.

## Werker – newborn language abilities (2:22)
Communicating & learning - 2.1 Early language development

It's really fun to work with newborn infants. And to try to figure out what they know and don't know about language, or what kinds of biases and preferences they have. And researchers who work with newborn infants take advantage of the repertoire of behaviors that a newborn infant has. In my lab, we take advantage of the sucking reflex. So when they're born, newborn infants have a reflex to suck. You put your finger in a baby's mouth and they'll start sucking on it. Many babies are born with a blister from sucking their thumbs in utero. So the sucking reflex is something that's very well developed. And you can change the properties of the sucking reflex by presenting infants with stimuli, sounds or sights that they find interesting. So if you make it that every time a baby gives a strong suck for them that they get to hear a sound, they will change the number of strong sucks that they give per minute. They will give more strong sucks so they can hear more sounds.

You can condition the burst interval in sucking. Babies suck in bursts. They go (sucking sound) and so the strength of the suck, the duration of the suck, and burst, and the interval between bursts; all of those babies will change in order to see or hear interesting stimuli. And so, in my lab, when we test newborn infants on their preferences for different properties of language or on their ability to discriminate one type of sound from another, we use high amplitude sucking. So we present babies with a sound every time they do what is a strong suck for them, a high amplitude suck, and over the course of several minutes they suck quite vigorously to hear sounds. And they will suck more vigorously to sounds that they prefer over sounds that they don't like. So we can count the number of high amplitude sucks per minute to the native language versus an unfamiliar language, for example, or to speech versus non-speech, and newborn babies will show us what their preferences are by the number of times that they choose to suck in order to hear those sounds.

## Werker – predicting later language and literacy (4:28)

Communicating & learning - 2.2 Literacy

One of the most important questions in the field of language acquisition is whether we can predict from early language development, later language skill. So can we identify in infancy, toddlerhood or the early school years, the child who's later going to have difficulties speaking, reading, spelling with some more complex use of language. If we could identify, reliably, those children who are developing well, those children who need just a little bit of a push to achieve their potential, and those children who need more specific targeted intervention and just what that intervention is, I think we would all feel that our work on basic language acquisition had been able to make a difference in children who may not be developing so well. And there is an enormous amount of work showing continuity in some realms of language acquisition from early to later years.

So, for example, there are the studies, the Hart and Risley study showing that the richness of the vocabulary input that the child hears in the toddler years predicts the size of their vocabulary. There are a number of studies showing that phonological awareness, so children's ability to rhyme, to show alliteration, and that's recognizing the same sounds at the beginning of words, to count the number of syllables in a word or the number of phonemes, the word cat, for example, has three phonemes c-a-t; those kinds of phonological awareness skills at three and four, predict reading readiness very well. And there are a number of researchers around the world, including in Canada, who have shown that if you go into a kindergarten or grade one classroom and identify the children who do not have good phonological awareness skills, or simply introduce an across-the-board program for all children, with little games to facilitate phonological awareness, that the number of reading problems decreases significantly.

So knowledge of the properties of sound of words is useful in translating between listening and reading. And using, sort of, the orthography to map sounds to letters. There's no question about that. So that's some work that shows a relationship between early language acquisition and later literacy.

There's also work on the pragmatics of interacting with children. Children whose parents read to them, just open a book, turn the pages, those children have a more positive approach to learning how to read and are more successful when they start school.

A focus of my work and the work of a number of other infancy researchers now, is to try and reach down into infancy and to see if some of the pre-language skills that emerge in perception of language, in simple associative word learning and even in things like the quickness with which you can recognize a familiar word in the first couple of years of life; whether those will predict later language skills and later literacy. I can tell you that we're working on these questions and that the results to date look very promising. There are a number of other labs around world, also working on these questions and it's kind of exciting that infants' speech perception and early word learning research has reached the level of maturity where we have stable enough findings about the descriptive aspects of typical language development in the infancy period to be able to use these milestones we've identified in infancy to see if

children who are not achieving these milestones at the same age as other children or as successfully as other children are those children for whom early intervention could be very effective.

## Williams-Ridge - outdoor play (1:36)

Communicating & learning - 3.2 Planning environments for learning

Sometimes in the classroom children may be very reserved, or because of the space might not be as open to different relationships or trying new things, but sometimes outside because of the natural sunlight, or because of them having the sensory experience of the wind and the sound and the smells, they're able to connect, maybe not with another child right away, but they're able to make connections and they can connect with teachers and children. And a lot of children show a different style of leadership when they're outside as opposed to in the classroom. Even in children that you might not expect it to.

So sometimes it's a challenge for teachers to be able to supervise that, especially in a large open space, but it's also a chance for those children to exhibit some of their own leadership skills and work a lot on conflict resolution because they're a little bit further away from a teacher, and so sometimes they have to work on their skills on their own, and a teacher sometimes doesn't know until things have escalated to a certain point and then the teacher can become engaged. But up until then children have been working on solving a problem together, and I think that is an invaluable experience that the outdoors provides, not only for the children who are having the conflict, but for other children who are watching and can say "They're arguing about a shovel, how are they doing it?" and it provides chances for children to almost mentor and role model for each other.

## Williams Ridge - Setting up the classroom (1:52)

Communicating & learning - 3.2 Planning environments for learning

We try and be intentional with everything we do with children, from setting up the way that the babies look, to having pets in the classroom that children can study and learn more from, and we try and accent everything in the classroom with a touch of something that makes people feel warm and comfortable.

Because one of the biggest goals of preschool is the social development of young children and in a calm environment children are much more likely to form relationships with each other and with their teachers. We also want them to know where to find things. So that they can start to build their ability to: be creative, to be big thinkers, to think 'just because I have these materials on the table, I know where a shelf is where I can get something that I'm really thinking about because I want to make a bigger project'. Or, we really want children to go with their thoughts and their creative process and keep developing and keep trying new things and experimenting. So, we have things set up in a predictable way, where children and their teachers know where to find things and where teachers have the resources close by to help scaffold children and help them learn a little bit more than maybe they were ready for at that moment, just to keep the learning process going.

We do find that children are able to focus longer on, on the material when they're able to come up with something new to try with it. So offering Playdoh or clay one day, but having the tools nearby so when they're ready, and when they've shown some proficiency, either a teacher can point out some of the tools, or they can look to a predictable place to find the tools that they really would like to use to kind of further their development.

## Williams-Ridge – understanding through play (0:54)

Coping & competence - 3.3 Valuing play

I came in class one day because there was a child who was having a difficult transition, and he had gone to the doctor earlier in the day, and there was a book on the shelf that talked about, it was actually Berenstain Bears "Trip to the Doctor" and we sat down and we read the book. And he started to ask a lot of questions about, you know "well what is that tool?" (it was a stethoscope), and I said "well there's lots of tools that doctors use in the office to help take care of people", and when we were done with the book we went into the teacher closet and everything was arranged by subject. And we pulled out the doctor bin, and were able, and so I said, "Choose five things that you'd like to take back into the classroom" and took them back in, and he started to use them with the dolls that were in the classroom, and I was able to give him a firm understanding of what the doctor was doing, and even a little bit more about why.

## Williams-Ridge - welcoming environment (2:36)

Ecology of childhood - 3.2 Strengthening early child development programs

We want to welcome children and families into the classroom, we also want teachers to be able to do things like read a story comfortably to a child or two. And there's something about having soft surfaces that really allows you to relax a little bit more, you can read a longer story and children will have that more home-like feeling and it does help build relationships when you can sit down on something where you and a child can sit comfortably and share in a story.

We do use natural colours, lots of greens and wood tones, and things that aren't too bright. We don't want the environment to be over stimulating, we want it to feel calm and welcoming, but also have some places where things pop like: flowers, that have a little bit of purple on them, or things that have different textures, we want children to be able to feel those things in the classroom as well as outside.
One of the great things about being outside is that children have the ability to touch different textures and smell different. They can use their whole bodies to engage, and we try and reproduce that as much as we can in the classroom with materials that also feel very natural and don't distract children from what we would like them to experience for the day.

The caves are kinds of a side bonus of having observation booths in the classroom, but they offer children a place to be, with, either alone, or just in a cozy space where they can really control all of the sounds and all of the things that they're experiencing. Some children like to use it as a place to just look at a book, but other children also use it as a place to go with a friend to build something special, or a teacher and a child might sit in there and, you know, look at a puzzle, or do something unique. It's nice to have those small places in the classroom, kind of like for an adult where you have something like a hammock or something like a study, where you have a small room that you can focus in on the material and you can kind of, control the variables in the space. So, the caves are a nice bonus, without the caves, the teachers create things underneath lofts, and there are fun places outside, especially once the greenery; there are some willow huts where children can go inside and you know, one, two, maybe three children can fit inside and create a cozy place.

## Zelazo – developmental outcomes (1:33)

Coping & competence - 2.1 Early regulatory systems

Executive function is emerging as a very important determinant of key developmental outcomes. Including, for example, academic performance in high school. So executive function measured during the preschool period predicts children's SAT scores in high school. And it predicts other important developmental outcomes. It's a good predictor, for example, of substance abuse problems, and criminal convictions, and so forth, much later in life.

And so there's been an awful lot of research in recent years, aimed at discovering ways to promote the healthy development of executive function. And increasingly, people, I think, are coming to realize that it is indeed something that is quite malleable, and can be trained. It's a skill like other skills. And our research has emphasized the extent to which the key underlying skill is the ability to step back and reflect upon one's own representations.

Not to just act impulsively, or immediately in response to a situation, but instead, to stop, and think, and consider the current context, and consider the long term outcomes of different potential behaviour, behaviours.

## Zelazo – introduction to executive functions (2:13)

Coping & competence - 2.1 Early regulatory systems

Well, executive function is a term that overlaps considerably with self-regulation. But it's a neuropsychological term that is used to refer specifically to those psychological processes that are involved in the more deliberate top-down, so to speak, aspects of self-regulation. So, when people use the term executive function, generally speaking they're talking about the processes that are involved in the deliberate self-regulation of behaviour. And more specifically they tend to refer to processes including cognitive flexibility, inhibitory control, and working memory, or keeping something in mind in order to use it in kind of a deliberate fashion to guide your behaviour.

Cognitive flexibility refers to the ability to think flexibly about a particular thing. To view, it for example, from multiple perspectives simultaneously. And it's manifested in interpersonal interactions, for example when understand that I think one way about something but somebody else thinks differently about it. And it's absolutely essential for flexible problem solving to be able to re-imagine, for example, an alternative way of achieving the same goal.

Inhibitory control refers to the ability to suppress a tendency simply to repeat whatever one has done in the past. And one may need to inhibit a particular motor response—a kind of overlearned behavioural routine, but also to inhibit attention to distracting or irrelevant information. And then working memory is typically used, the term is used to typically describe not just keeping something in mind, but also being able to turn it around in your mind, and manipulate it in addition to just maintaining information.