

## **Transcript : The Health Report Baby DVDs 17<sup>th</sup> March 2008 ABC Radio National**

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Television is blamed for lots of things that go wrong with children from ADHD to violent behaviour, to learning problems, to obesity. The box is demonised at the same time as the film and television industries tell us the evidence isn't in that there's a problem.

Someone who believes the evidence is in is Professor Dimitri Christakis who's Director of the Child Health Institute at the University of Washington, Seattle. His research is showing that it's not so much the box but what's on it and fascinatingly, sometimes how it's actually edited, that can be damaging.

**Dimitri Christakis:** To put it in the brightest context we have to think about the fact that we are technologising childhood in a way that's truly unprecedented. In 1970 in the United States at least the average age which children began to watch television was 4 years of age. Today, based on studies that we and others have done, the average age at which children begin to watch television is closer to 4 months of age.

**Norman Swan:** 4 months?

**Dimitri Christakis:** 4 months, 30% of preschool children in the United States have televisions in their bedrooms and they spend on average one to two hours a day watching TV. And to put that number in perspective, keep in mind that children of this age are only awake for about ten to twelve hours a day, and so you realise they are spending somewhere between 10% to 20% of their waking hours in front of the screen on average and one can't help but wonder what the effects of all that are.

**Norman Swan:** So let's look at this latest study then we'll work backwards. Tell me about these baby DVDs that are on sale.

**Dimitri Christakis:** Well there's been an explosion really in the last ten years in this country and I suspect it's true in Australia as well, products that are directly designed for infant viewing. There's a whole list of them and they make fairly outlandish and unsubstantiated claims that they will make your children smarter, more musical, that they teach math and language. To a large extent that marketing effort has been very successful, it's a \$500 million a year industry and it's immensely popular with parents of young children.

**Norman Swan:** And what's on these videos?

**Dimitri Christakis:** What's typically on them and the content varies, what they have in common is they have a very rapid sequenced quick edited series of pictures and a musical accompaniment. The pacing of the program is actually worth talking about first because it's the primary way that infants are kept engaged in the screen - keep in mind that babies this young don't actually understand the content of what's on so what keeps them engaged is the

rapid sequences of edits. Those constant changing images and sounds engage what's called the orienting response, it's a primitive reflex that was first described by Pavlov in 1927, the Pavlov of dog fame, he called it actually the what's that reflex. It's a protective reflex that we have such that if we hear a strange sound, or see a strange sight, our mind automatically focuses attention on that.

**Norman Swan:** Because we're tuned to change, so if you actually go to a baby and do things to a baby eventually the baby will switch off, but if you do something new the baby will become alert?

**Dimitri Christakis:** Exactly and that alert is actually a protective mechanism because a strange sound or sight could represent a potential threat and so you get instant engagement at least until such time that the baby's either assured that it's not a threat or that they lose interest in it. So these rapid scene cuts are precisely what keeps babies engaged in the screen, in fact parents report of their own volition that children are mesmerised by the screen, that they appear to be just fascinated by the content.

**Norman Swan:** They probably become convinced that it's doing them immense good?

**Dimitri Christakis:** Exactly, and in fact there's no reason to believe that such stimulation is good. We had a hypothesis that in fact that level of stimulation, precisely because it is super-natural, hyper-natural would be damaging to the developing brain. Because you have to keep in mind that we're born with our brains not fully formed, the fine tuning of the mind if you will happens outside of the uterus, the new born brain triples in size in the first two years of life. And it does so in direct response to external stimulation, so the wiring of the mind is laid down so that the brain is accustomed to the world in which a child lives.

**Norman Swan:** So in other words in theory you were worried that a hyper-alert mind might come out, in other words a baby that might be or a child that might be hyper responsive to stimulus which would create perhaps an attention problem or something like that?

**Dimitri Christakis:** Exactly, the concern was that this level of stimulation which was unnatural would condition the developing mind to view that as normal. And then by comparison real world would be unsatisfying, it wouldn't be stimulating enough. And that study which we did found exactly that.

**Norman Swan:** So what did you do?

**Dimitri Christakis:** We took over a thousand parents and asked them when their child was one how much television they watched on a daily basis and then when their child was three we asked them again how much television their child watched on a daily basis. And when their child was seven they were asked a series of questions to determine how well their child was actually able to pay attention, how well they focused, how impulsive they are. What we think of as being the core symptoms of attention deficit disorder but I should point out explicitly that we did not diagnose these kids with ADHD, doing so requires input not only from parents but from teachers and we had no teacher input into this study at all.

Nevertheless what we found was that the more TV children watched before the age of three the more likely they were to have attention problems at age 7, specifically for each hour of TV the children watched on average before the age of 3, their chances of having attentional problems at age 7 were increased by about 10%. To put that another way a child who watched 2 hours a day of TV on average before age 3 would be 20% more likely to have attention problems at age 7 compared to a child who watched none.

**Norman Swan:** And was it related to severity, you're just talking about incidence but if you're wanting a true biological effect you really want a dose effect. So what you're saying is your dose effect might give you a greater likelihood but on the severity scale of attentional problems did you go up the severity scale if your child was more exposed earlier on?

**Dimitri Christakis:** We found there was in fact a linear relationship between the amount of time the children watched and their likelihood of having attentional problems later on in life. Our hypothesis was that this had to do with the pacing of the programs and so we recently followed that study up, this was actually just published in the last few months, with a different sample of children. These were 500 people who again were asked at age 1 and 3 what their children watched but this time they actually gave information on the kinds of programs their children were watching. We coded those programs as being either educational, entertainment or violent and our hypothesis was that violent and entertainment programs would have a faster pacing than typical educational programs and that those would pose risk for attentional problems subsequently.

**Norman Swan:** Did you verify that by watching the program?

**Dimitri Christakis:** We did not watch, there were thousands of programs and there are valid reasons to do that because other people have actually looked at the typical pacing of these kinds of shows and on average it's true that educational programs have slower pacing than entertainment/action.

**Norman Swan:** Sesame Street versus LA Law.

**Dimitri Christakis:** Actually in this case it was really more Sesame Street versus kind of violent cartoons cause these were young kids and what we found was that in fact the violent programming had over a twofold increase risk, so kids were twice as likely to have attention problems for each hour on average they watched violent programming and entertainment programming was about one and a half times more likely to lead to attentional problems. Interestingly educational programs did not pose any increased risk at all of attentional problems so this provides further evidence that in fact it may well be the pacing of the programs rather than the medium itself that creates risk.

**Norman Swan:** So let's just double back here, let's go to the one about simply the exposure to television. Food diaries to take an example are notoriously inaccurate in terms of measuring people's intake of food and you're asking people retrospectively to assess how much television their children watch. How accurate is that assessment?

**Dimitri Christakis:** Well that's a good question. Retrospective assessments of TV viewing are in fact inaccurate, as are retrospective dietary recalls, the dietary diaries if they're kept contemporaneously are actually quite good and in fact that is what we did in this study. We didn't ask them 'how much TV did your child watch years ago', we asked them how much they watch on a typical day today. In the more recent study they did keep actually not just TV diaries but time diaries so we extracted the TV data out of the diary they kept contemporaneously for the entire day what their child did. And those kinds of diaries have actually been validated repeatedly and are used extensively in economic research.

**Norman Swan:** The other question is there maybe something about households where children are parked in front of the television, or even households which might you know have televisions in children's rooms. To what extent did you control for the social and economic and educational levels in each household?

**Dimitri Christakis:** That's a very good question. So this was an observational study, it was not an experiment, we did not randomise children to watch or not watch TV. We controlled for a vast variety of potential confounding factors, we controlled for parental income, we controlled for the number of kids in the family, we controlled for parental educational status, we controlled for the amount of cognitive stimulation that parents provided. Questions such as 'how often do you read to your child, how often do you take your child to the museum'? We controlled for day care attendance, we did the best we could in the context of a retrospective study. It's true that to be definitive in this one would actually need to do an experimental design and we are in the midst of trying to attempt to do that. But I think in the meantime we have to be very aware of the fact that to date there is absolutely not one scintilla of evidence to suggest that early viewing is in fact beneficial. And the preponderance of evidence based on studies that we've done and others have done is very strongly suggestive of real harm so I think the prudent thing for parents to do under the circumstances is really to try to minimise their child's exposure to rapidly sequenced TV in the first two years of life.

**Norman Swan:** So tell me - let's go back right to the beginning to these infant programs.

**Dimitri Christakis:** So in a separate study we actually did of 1000 children we specifically asked parents how many hours per day their infant watches baby DVDs and we gave them examples of what we meant by that and then we also asked them what other kinds of programs they watched. And we also did an assessment of their child's language development, how many words they actually recognised. And what we found in that study was that for children between the ages of 7 and 16 months the more baby DVDs they watched on average the fewer words they knew of words they would be expected to know so specifically each hour of baby DVDs per day resulted in about six or seven fewer words being known by the children in that study.

**Norman Swan:** And later language acquisition? Have you followed them up long enough?

**Dimitri Christakis:** No in that study what we found interestingly was that the older kids there was no effect so it really was a matter of very young children being somewhat

delayed and there's a suggestion at least that they may in fact catch up which is reassuring. But nevertheless one is left with the fact that for parents who are using these baby DVDs -

**Norman Swan:** It's not for catch up they are hoping for acceleration.

**Dimitri Christakis:** Well they are hoping for acceleration and in fact the baby DVDs themselves have terms like language nursery, teaches your child language and we found no evidence of that. In fact we found evidence of delay associated with these DVDs and parents should be very mindful of what they are really getting for the \$20 they drop on these DVDs.

**Norman Swan:** To what extent do you think this is a neurological effect of the DVDs on the brain, this pacing situation not just on attention but on language acquisition or is it just displacement, the number of hours a day that you're watching DVD as a baby are not in front of your parent or a carer who's talking to you and playing with you?

**Dimitri Christakis:** It's an excellent question and we don't actually have enough research today to tease that out. I often say that science is not keeping pace with the rapid uptake of this technology and in fact as a result we're in the midst of a huge national, I suppose we should say international experiment on the next generation of children. There's ample reason to be concerned because of this period, this critical period of brain development in the first three years of life, that in fact there may be neurological deficits that persist throughout childhood. You know the truth is that this explosion of the 'build the brain in your baby juggernaut' has a lot to do with cognitive psychology and developmental paediatricians, those of us who for a long time try to champion the idea that birth to 3 years is a critical time period. And there's very good scientific evidence that there is, this led to the notion that we really should be taking advantage of that and providing the right kinds of stimulation that has then in turn led to this notion that we can manipulate it better and better, better stimulation and it's fundamentally premised on the notion that more is better. Our argument is that in fact there's something called too much and over stimulation or the wrong type of stimulation.

**Norman Swan:** You've gone back to basics though and looked at some of the things that parents have probably done for centuries with their babies to teach them either consciously or unconsciously language.

**Dimitri Christakis:** Well that's right, you know it's funny, we did a study here now, we've just completed it and it was published and in that study we took children 18 to 24 months of age and we randomly assigned them to get building blocks or not. So half the kids got a pretty good set of building blocks and the other half did not. And in addition their parents got a set of block activities, sort of recommendations for how to play with your child with blocks.

**Norman Swan:** Tell me about that.

**Dimitri Christakis:** Well they were very simple things actually but some things the parents may not immediately think of, stack the blocks with them, sort them by colour, count the blocks, build a specific type of thing with them.

**Norman Swan:** And talk while you're doing it.

**Dimitri Christakis:** We didn't actually tell them to talk while they were doing it, but of course that comes naturally. We were in effect trying to simulate a situation in which families were either gifted or bought blocks so we really did an experimental design to try to keep everything else equal except for the fact that one family had suddenly acquired a set of blocks. These were low income families and what we found was that six months later the children who had got the blocks actually had significantly higher language scores than those who did not. In fact they scored 15% higher on average in terms of the number of words they knew compared to the control group. And I think that this is very significant for two reasons, first it's the other side of the coin when we were talking about television we were talking about the possibility as you suggested that these language delays may represent displacement of other kinds of activities and in fact they suggest that that may be the case. There's certain types of things that you do that promote language and there are other kinds of things that parents do that could actually delay it. But the other thing that I think is significant is that there's been this dramatic change in play and toys, you know we ask a lot of our toys these days. 20 years ago it was enough that children had fun with what they played with but now there's an expectation that it be somehow educational, that it make them smarter and blocks is an example, they've never made claims about educational value. I mean I grew up playing with blocks and even to this day my children have blocks and we bought them and the box never said this will develop your engineering skills or improve your language skills etc and yet it appears that they actually do.

**Norman Swan:** And with the blocks and this trial that you did, and that was a randomised trial, to what extent was it the attention that they got versus the blocks, so what did the control group get?

**Dimitri Christakis:** The control group got nothing, they actually got the blocks at the end of the study.

**Norman Swan:** So it was ethical.

**Dimitri Christakis:** It would not have been fair, in fact it was the easiest study I was ever recruited for because we showed up in a clinic with stacks of blocks and the kids came running over saying they wanted to participate so it was easy to recruit but we had to be fair and give everybody blocks. The short answer is I don't know whether it was the blocks themselves, to be sure I would not posit it that if we put children in a room in vacua with a series of blocks that they would learn language. There's no question that language acquisition comes through interactions with parents.

**Norman Swan:** It's just a tool for interaction.

**Dimitri Christakis:** It's a tool for interaction in part but there's another thing too, there's a phenomenon called scaffolding. I tell this to parents all the time and they even reported it in the study that after they played with their children with blocks they would notice their children would continue either then or on other occasions to do the same kinds of things that they were doing. So if they were sorting them by colour they would note the child was sorting them and the truth is that what the children are doing in those situations is

developing mental schema so as you said yellow, red, purple as you sorted the blocks and they are sorting the blocks, even if they are not actually saying it, they are practising it internally, they are developing what's called the scaffolding of the mind, it's a precursor to language. It's nothing unique to blocks but it's the type of interactive play that parents do with their children that children can do on their own that helps actually foster the development of language.

**Norman Swan:** So is there any evidence that, coming back to watching the box that the sorts of activities which are done on Sesame Street and similar children's television in Britain and Australia which uses those kinds of principles, actually has an effect when it's an adult behind a screen, a two dimensional screen, rather than in front of you?

**Dimitri Christakis:** It's a very good question. So let's start with a show like Sesame Street. Sesame Street is actually a terrific show, it's not meant for infants it's a very good show for pre-schoolers and in fact it has succeeded and been shown scientifically in promoting recognition of words, numbers, letters, it's a good educational show and in fact it even has been shown to improve children's pro-social behaviour. That's for older children. Now when we talk about younger children, under age 2 there's what has been well described as the video deficit. I'll give you one very salient example, children learn better from a native speaker speaking to them in person and in fact if you video tape that precise person saying the exact same thing and randomised children to either hear the speaker live or see him or her on screen saying the exact same thing, they'll learn much better from the actual live person.

So there is in fact some part that is lost, whether it's the two-dimensionality of other subtleties of the interaction is not clear. But children do learn best from real human interaction. That shouldn't be surprising to any of us, I mean this is the way that we have evolved, TV has only graced us for 50 years, we've been teaching our children for millennia.

**Norman Swan:** You've done some work on TV and aggression, it's an eternal debate and there have been enquiries which suggest - is there are relationship between children's aggression and the amount of aggression you see on television and other enquiries which have said there isn't?

**Dimitri Christakis:** I have done work on that, you know it's funny that it's considered to be controversial. In scientific circles the debate around whether or not screen violence and real world aggression are linked is over. The preponderance of evidence if you do a metanalysis as has been done and take the hundreds of studies that have been done and summarise them suggest that the link between aggression on screen and real world violence is as strong as the link between smoking and lung cancer. Now the interesting thing is that the evidence is of the same type meaning that there aren't as many real world experiments as one would ultimately like as there never have been any with smoking, no one has ever randomised people to smoke or not. And people use the same kinds of arguments, they say my dad smoked five packs a day and was hit by a truck at 95, the argument is not that everybody who smokes gets lung cancer, nor for that matter everybody who gets lung

cancer smokes. The argument from a scientific standpoint is that the risk is significantly increased and in fact it is.

**Norman Swan:** So what did you do with your kids, I'm sure you've been asked this before?

**Dimitri Christakis:** I haven't been asked this and people are always surprised, I'm not actually anti-TV, I have a book that's entitled the Elephant in the Living Room - Make TV Work for your Kids. The truth of the matter is that part of the discussion around media has been misguided because people have thought of television monolithically and then asked the question is it good or bad. And the truth is it's inherently neither, whether TV is good or bad depends entirely on how it's used. The simple truth is that parents have to come to view TV as a tool and not a crutch and take active control over it. In our case, well I'll tell you, I have a 9 and a 6 year old, they did watch when they were pre-schoolers selective high quality, what I thought was high quality, educational programming and today while they are in school we have simple rules actually. It's funny, they were rules from my childhood which now seem rather archaic but we had no TV on week nights at all, that's always been the case, even when they were actually in preschool and then on Friday night we have what's called family movie night and my wife or I select the movie, we actually tried selecting with the kids for a while and that only led to chaos in the video store. So my wife and I just decide and initially there was some grumbling about that but once it was conveyed to them that we choose the family movie and they choose whether or not they want to watch it, they've happily gone along. And many of the movies we watch are actually movies from our childhood and we've mixed it with some newer ones that are actually also quite good.

**Norman Swan:** Agony if you've got to watch it and the kids aren't in the room.

**Dimitri Christakis:** Never happened, never happened, they always end up wanting to watch in the end.

**Norman Swan:** But the core message I'm taking away from what you're saying is before the age of 3 be very careful about exposing your kids to television?

Dimitri Christakis; Yes, certainly before the age of 2 be very careful and then thereafter, I mean we're talking about young children but the risks change but never go away. And the benefits always remain there. You know one of the things that is interesting is that there is an enormous focus on the amount of TV that children watch, that's typically the highlight getter because people have this obsession that we are very, very sedentary. But keep in mind of course that reading is sedentary too and nobody ever gets excited about reading as being the cause of obesity. But the thing that doesn't get enough attention is the content, namely what children watch which is enormously important, it's as important as how much they watch, and the second thing is the context of viewing which has also changed dramatically. When television was first invented families typically had a single set, it was centrally located in a house and it was high quality, prime time programming that really brought families to watch together. Today most families have two to three sets on average in their home and in fact they typically watch separately. The reality is that TV has shifted from a medium that brought families together to one that increasingly pulls them apart. The

context of viewing is very important because one, family time together is inherently a good thing. Two the best quality programming, whether it's educational or entertainment, the value of it has been shown to be enhanced by parental presence. And also finally the bad elements of programming, the risk of TV can be significantly mitigated by parental presence and unfortunately many parents absent themselves when their kids are watching. It's an opportunity for parent only time, it's a baby sitter and I think that's unfortunate.

Norman Swan Dimitri Christakis is Professor of Paediatrics at the University of Washington Seattle and he's also Director of their Child Health institute.

Reference;

Christakis DA et al. Effect of Block Play on Language Acquisition and Attention in Toddlers: A Pilot Randomized Controlled Trial. *Arch Pediatr Adolesc Med*, October 2007,161;(10):967-971

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## Guests

### **Dr Dimitri Christakis**

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