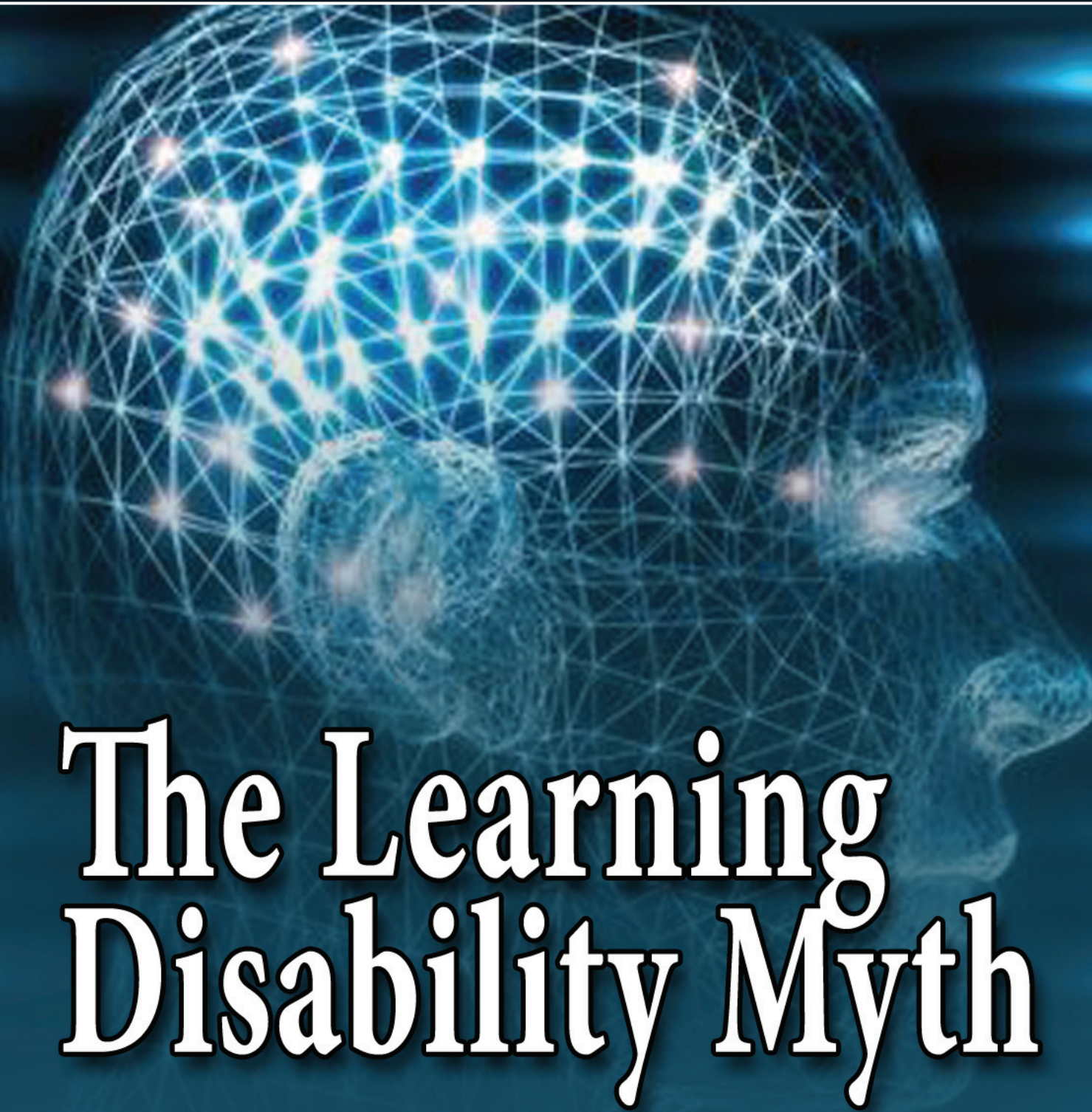


"GREATEST MINDS ON ADHD" SERIES



The Learning Disability Myth



**An Interview with
Dr. Robin Pauc**

Hosted by Dr. Yannick Pauli
www.unritalinsolution.com

Dr Yannick Pauli: Now, welcome to the Unritalin Solution’s “Greatest Minds on ADHD Interview Series.” I’m your host, Dr. Yannick Pauli. And today, I have another very special individual with me. His name is Dr. Robin Pauc. Dr. Pauc is a Chiropractor who graduated from the Anglo-European College of Chiropractic in 1974. He’s also a diplomat of the American Chiropractic Neurology Board and a Past Assistant Professor of Clinical Neurology. He has been in clinical practice for over thirty years and now has a special interest in developmental disorders in children. He is the Director of the Tinsley House Clinic in the UK, and had established treatment centers across the UK and in several foreign countries across the world. His clinic is an accredited research clinic and he has published several research papers in peer-reviewed journals. He’s also the author of three books for the public, the first one is called, “Is That My Child,” which was a number one best selling book on Amazon. The second one is the “Brain Food Plan,” and the third one is, “Could It Be You?” which is a book for adults and they are now available in six languages. Dr. Pauc, welcome to the show.

Dr Robin Pauc: It’s good to be with you.

Dr Yannick Pauli: One of the first things I’d just like to clear for our listeners, your first book, “Is That My Child,” I think that was the English version, right? It has another title for the United States?

Dr Robin Pauc: Yes. The UK version is, “Is That My Child?” and then the American version is the ‘Learning Disability Myth.’

Dr Yannick Pauli: Okay, great. Thank you for clarifying that so that people don’t jump on Amazon, and start looking around and might not find if they are in the United States or somewhere else. So the first question I’d like to ask you, Dr. Pauc is, could you go a little bit over your background and, you know, what got you interested in Chiropractic and how you ended up interested in developmental disorders and especially in children?

Dr Robin Pauc: Okay. Well, you’ve gone through my CV pretty well already. I started off life working in the field of psychiatry in rehabilitation. So I’ve always had an interest, and certainly, when I was at – after AECC, I lectured there for a time in abnormal psychology. So the interest has always been there. I did the Post-Graduate qualification at the ACNB, and was fortunate enough to pass that. Then, as you mentioned earlier, I was lucky enough to be asked to teach neurology. Now, obviously, when you’re teaching Clinical Neurology at a Post-Graduate level, you have some pretty smart students, and so you have to be pretty well on the bowl. You have to know exactly what you’re talking about, have a deep understanding. And one of those things as I’ve realized, pretty early on was that I really didn’t understand things like dyslexia, dyspraxia or attention deficit. And as I sort of researched it, I found in fact that most people in the world didn’t have a really good handle on it. And this is what really motivated me, and I think probably, I will – I must have been thinking about it unconsciously. And one day, I just thought to myself, well supposing that these things aren’t actually conditions in their own right. Supposing that they are

symptoms, and they are symptoms that always appear in co-morbidity. They always appear together. So you might bring your child to see me because they're struggling to read and you think they may well have dyslexia. But the chances are, by the time I've taken a detailed case history, carried out an examination, I would discover that in fact they may have a reading disability, dyslexia, they may also be dyspraxic, and they are almost certainly also be suffering from attention deficit. Now, once you do that, then the situation becomes much clearer because you can identify various parts of the brain with the symptom patterns that you're getting, and then it becomes amenable to treatment. So one of the things that's sort of annoyed me early on is that all sorts of people would carry out sort of really clever tests, and say, "Okay, yes. On the basis of these tests we have carried out that your child has got dyslexia or your child has got dyspraxia." But then they don't offer a treatment solution, so... okay, if you just want to label, that's fine, but if you want your child to be fixed, you need to do something to actually address the issues, not just to identify them. So, that was really my starting point in why I sort of became so interested in neurobehavioral disorders. And the more I've delved into it, the more I found that there is more to be discovered.

Dr Yannick Pauli: I think you've published research right on the topic of co-morbidity, could you discuss a little bit how the percentage of or the incidence of that co-morbidity in children that you see, and how that compared to the prevalence you would expect in the general population?

Dr. Robin Pauc: Right. What we found really is that dyspraxia is almost universal. So regardless of whether you've got a child, he's got the learning disability or behavioral disorder; the chances are that they will have aspects of dyspraxia a very, very high rate. I'm not going to bore your listeners with all of these stuffs in details, but it's a very high percentage. So currently, we're talking about probably one child in every five having some form of problem. Now, these problems maybe transient, they may pass. So one of the things I always tell people who may contact me because they are worried about their child blinking; they think maybe they've got a Tic disorder, maybe they're going to have Tourette. Sometimes, it's just a minor glitch, the brain isn't developing quite as it should be, as smoothly as it should do. So sometimes these things happen. But the actual patterns of co-morbidity are very, very strong. So if I give you some sort of simple examples, if we're looking at, say, Attention Deficit Hyperactive Disorder, its going to be a very high percentage associated with that old dyspraxia. There is also obviously going to be a high percentage of attention deficits but there's also a higher rate of Tourette's syndrome associated with it, and then there is say OCD or dyslexia. If we look at that, for instance, what can I think of? I'm trying to think of something off the top of my head that would fit. If we look at dyslexia, because dyslexia is one of my particular areas of interest, again, the highest rate of co-morbidity is going to be dyspraxia, and the second highest co-morbidity rate is going to be attention deficit. So each area, each primary symptom if you like, will have its own specific pattern. But in each and every single one of them, dyspraxia is going to be the most common co-morbid symptom.

Dr. Yannick Pauli: So could you explain a little bit why you think we find that dyspraxia or this motor problem related to these cognitive problems?

Dr. Robin Pauc: I think probably what it is that if you think of how the brain grows and develops and this is a very poorly understood area of neurology. Basically, the more primitive areas tend to develop first of all, and then the higher levels tend to develop at a later stage. Now, a lot of dyspraxia will originate in areas like the Cerebellum, the back of the brain and in areas closely related to them like the Retrosplenial area, the back part of the inside wall of the brain. Now, you’ve got to get those areas working first because each side of the Cerebellum work with the opposite side of the brain. But also, the Cerebellum is intimately related to activity that’s taking place in the Brainstem. So for instance, in the bottom of the brain, then you got the inferior olivary nuclei, which pulsate spontaneously. But both sides have to pulsate at the same speed, between eight to twelve hertz. Many children are out of sync here, and this will cause problems in what the left hand and what the right hand is doing. Also, you have to bear in mind that in a lots of the text books there are some simple errors. For instance, if you are right handed, as most of the population will be, one would assume it’s the left side of the brain that is controlling the right arm and right hand. But it’s correct that the left side of the brain is controlling the right arm. But it’s a special area on the right side of the brain and what’s called the mid-Cingulate area where Gigantopyramidal fields control fine motor skills. Now, again, most people don’t take this into consideration, and therefore, don’t understand why you can have problems which may only be with fine motor skills, may only be with gross motor skills or can be with both. Again, it’s lack of knowledge within these areas that causes the problems, but its how the brain develops. And one of the other things that people don’t realize, most people assumes that the brain is complete at birth. Now, we know now that it’s far from that. And basically, the brain and its development, its morphogenesis continues after birth for a long period at a very great speed, the fetal growth rate. Now, that morphogenesis has to be governed by something. Recent research would suggest, it’s a thing called the epigenome, which you can think of as being like switches that would switch the genes on, or alternatively switch them off. But what’s probably happening is, for various reasons, it could be maternal stress, fetal distress, environmental stresses, that can delay the switching on of genes and so certain aspects of morphogenesis maybe delayed, and that may well explain why we’re seeing more and more developmental delay. And it will also explain why you’ve got this high rate of co-morbidity with dyspraxia because basically, you need to have motor skills, motor movements before you can have things that – much higher level – higher thoughts, which would take place in the high levels of the prefrontal cortex. Does that answer your question?

Dr. Yannick Pauli: Very interesting. Yes, definitely. And I think what you just started to talk about here is a very good segue into the next topic that I wanted to ask you about, and is, yeah, discovery of those cells that are referred to Von Economo cells. Could you talk a little bit more about them, why they are so special and what happens to them, how they develop and how you think they play a role in things like autism and other disorders on the spectrum?

Dr. Robin Pauc: I can, yeah. Now, I think Von Economo neurons, probably one of neurology’s best kept secrets because they’ve been known about since Betz talked about them in 1881. I think it was Cajal who talked about them in the 1890s. And it wasn’t until 1925 that Von Economo himself wrote his treatises in which he included quite a good description of what he, at that point, called Spindle cells. Now, although they were described by giants of neurology, they remained in obscurity until 1995, when Esther Nimchinsky wrote a paper in which she talked about them. She then wrote another one in 1999. And then in 2002, John Allman from Caltech started writing papers. We then have Patrick Hof, and then after that, “Bud” Craig amongst many others. So all of a sudden, there’s a huge interest in these brain cells. Now, the interesting thing about them, which has followed the research that was taking place, there is only 15% of them present at birth. The other 85% develop in a window of development, which takes place four months to four years after birth. Now, during that period, there’s a rapid development of these cells. One, they have to develop, two, they have to migrate, three, they have to make contact with other cells. They have to form synapses. Now, you would think logically that these brain cells, if they were going to go anywhere, their late developing there, sort of all singing, all dancing, now, top of the range brain cells. You would think they would go mainly to the left side of the brain because for most people, the left side of the brain is where things like speech, or you know, the higher levels of human or humanity will take place. But no. The strange thing is that there are more Von Economo cells on the right side of the brain than there are on the left. Now, that doesn’t seem to make sense until you think about it logically, that the right side of the brain has to deal with everything that’s new. That’s one of its primary functions, that’s why it’s the sort of the fight or flight side of the brain, it’s the emotional side of the brain, it’s dealing with everything new, it’s got to make a decision on things that are new. So therefore, what you need is these large fast conducting cells that can deal with things very rapidly. Now, initially, it was thought that they only existed in two areas of the brain. We know now that they actually exist in three areas of the brain, so we know that they’re in an area called the Insula. We know they’re in the anterior cingulate and we know that they’re in the Dorsal Convexity. Now, what’s fascinating about these cells is they’re only found, well, so far, they have only been found, in animals that have a large brain, larger than what would be expected, and also, animals that are engaged in social networks. So initially, they were found in the great apes, the orangutan, the gorilla, chimpanzee, bonobo, humans. After that, they were found to be present in whales, elephants, a few in dolphins and in the manatee. So we have a limited number of animals on the planet that possess them. We as humans possess more because basically, if you look at, say, in orangutan’s brain, they appear singly. If you go up through gorilla, chimpanzee, bonobo, human, the number of cells increases and the number of cells found in cell columns increases. So we have got the highest number of cells and the highest concentration in cell columns. And we’ll stress again, there are more found on the right side of the brain than there are on the left.

Now, in terms of what you were saying earlier about things like autism, in one of the John Allman’s papers, he suggested that based on his experimental work, he felt that perhaps if Von Economo cells don’t form or don’t form properly, then that could be

the underlying cause of autism. Another paper would follow that by another chap, and he said, “No, no, I disagree.” Now, in one of my papers I have looked at the evidence, and said basically, “You need to have a working definition first of all of what is really – what is autism? You got to have a definition that everybody can work as guidelines. You also need to have a significant number of samples, and those samples have to come from exactly the same areas of brains that you can compare like with like. Now, as far as I know, to date that hasn’t been done, so the question is still there. Are Von Economo cells involved in the development of autism? I think probably the answer is yes. But at the present moment of time, we don’t know how, why this happens. But it’s an open question, and a question that needs answering. At the present moment of time, “Bud” Craig, he is studying the Von Economo neurons, which are found at the very front part, the anterior aspects of the insula. Now, the insula is a very interesting area because basically, what happens is that the posterior part of it receives all the information that’s coming from within your body, so if you stub your toe, you’re hungry, you need to go to the toilet, all the information will be fed into the posterior part of the insula. All the information that’s coming into your body through your eyes, your ears, your skin, that then gets taken into the mid-section of the insula. And the posterior information is added to it, and then finally the emotional content of what’s happening, either what’s you’re feeling inside or what’s happening as a result of what’s coming into from the outside world is then added to it. And then you have this global moment, this is you at this specific moment of time, how you’re thinking, how you’re feeling. And that’s why you might ask me a question that’s perfectly reasonable and I snap your head off. And it’s not because I’m upset with you, it maybe that five minutes ago, somebody upset me, and you’re getting the consequences of that, because that emotional insult that I’ve received will be added to my global emotional moment. And if I’ve not recovered from it, if I’m really upset, you’re going to get a telling off for something that’s really not your fault, but these sort of things go to explain the sort of patterns of behavior that we go through. Is that pretty clear?

Dr. Yannick Pauli: Yes. No, it is truly fascinating. What I would like to ask you though is, you know, so we’ve started talking about the fact that most of those disorders, ADHD, dyslexia, they are more symptoms of an underlying developmental delay and those are Von Economo cells may play a role in that. Could you go into a little bit about what you think are some of the factors or causes or things that lead to the genes not turning on or turning off the way that they should, and that leads to that developmental delay as far as environmental factors.

Dr. Robin Pauc: Yeah. I mean basically there’s been a lot of research done in the field of autism into maternal stress. They’ve looked at what effects of viral infection would have upon the mother and the baby and the baby’s development. One of my own papers which is on fetal distress and birth interventions, and what we found was that if the baby has had fetal distress maybe the cord being wrapped around their neck or they’ve had to have a ventouse delivery then the chances of them having a developmental delay go up quite significantly. Now, we know that to be the case. John Allman, in a couple of his papers, has said the same thing that basically, if you

have stresses and our stresses could be anything from being afraid, very afraid of something or insulted by chemicals, gases, whatever. So one of the things that we have to bear in mind is that in the world we live in today, we probably eat seven to nine pounds of chemicals a year. We ingest this with the food that we're eating. Now, the reason this is probably happening is because in days of old, you had to buy food that was in season. You have to buy food that could be grown locally. You also had to buy food fresh and cook it pretty well straight away because there weren't things like freezers, fridges, microwaves, supermarkets whatever. So certainly, when I was a boy, my mother would go shopping pretty well everyday because we had nowhere at home of keeping the food fresh. And so if you bought food on the Monday and didn't eat it till Wednesday, Thursday, Friday, the chances are it will be going off. It would be going moldy or it would be infected in some way. So nowadays, we all have these wonderful things, fridges and freezers and microwaves. But for the Supermarkets, lot of the food that we think of as being fresh may in fact be a year old but it's been frozen or it has had things added to it to stop it oxidizing, to stop it going off color, whatever. So what we want, you know, when we go to the Supermarket, we expect to see things looking fresh and new and attractive and tasty and all the rest of it, we don't want to see something with misshapen or miscolored or whatever. So a lot of technology goes into producing foods that will have a long shelf life so that you can keep it on the shelf in the Supermarket. You can bring it home. You can keep it for a while, and eat it when you want to. Now, I think we do this at a cost and certainly, not only myself and people like John Allman, but the Mental Health Foundation produced a report called "Feeding Minds", in which they said that probably a lot of adult conditions, so adult ADHD, Dementia, Schizophrenia, so many conditions could be due to the fact that we're not getting enough of Omega 3 in our diets, which we need as a child to grow and develop. Sixty percent of your brain is fat, of that sixty percent, twenty percent is got to be Omega 3 so the child, but as an adult, we still have to continue having running repairs on our brain, and as adults, we still now need to have that twenty percent within our fat content in the brain. Now, the chances are that you're not going to get enough Omega 3 from your diet. You're probably going to get enough Omega 6, but not enough Omega 3, so you need to supplement it. There are many, many factors that our diets may need to be supplemented, that we're eating a lot of chemicals, that we're being stressed for long periods of time. There are also the factors that could influence not only the development of the brain, but the brain function as you go through life as well.

Dr. Yannick Pauli: All right. Could you go maybe into some practical tips that you could recommend to the parents who will be listening to these recording about concretely, practically, what could they do as far as nutrition to help their child without having to see necessarily someone? What are some of the basics they could go into?

Dr. Robin Pauc: Okay. Well, the first thing is that probably, pretty well every child will need to have Omega 3, Vitamin C, B Complex, Zinc, and Magnesium. And plenty of studies have been done around the world to show that in many places, children are hyperactive because there isn't enough Zinc, there isn't enough Magnesium in their diet. So certainly, you need to look up supplements. So Omega 3, Vitamin C, B-12 or

B-Complex, and Zinc and Magnesium. Now, the other thing you need to think about is simple logic. Most children will eat between six and seven o'clock in the evening, as their last meal of the day. They won't have breakfast again until probably at least seven o'clock the next morning. So we're talking probably twelve hours without feeding, so in the morning, the stomach is empty. What you need to do is start the day with protein, fats, and carbohydrates, not cereals. Now, the problem is with cereals is they are digested because they were already processed so they're pre-digested. So you need to have something that will stay in your stomach. A cereal, no matter how good they are, will probably be gone in an hour or hour and a half at the most. Then the stomach is saying, "I'm hungry." The other thing with cereals is, a lot of them have hidden sugars, hidden salt, and some of them actually have fats that you don't want. So you want to start the day with something like scrambled eggs on toast, sausage and beans, whatever, a cooked breakfast. And it doesn't have to be what you think of, as being in a traditional cooked breakfast. It could be fishcakes, it could be pate, you know, it doesn't matter as long as it's protein, fat, carbohydrate. Mid-morning, a piece of fruit, at lunchtime, mid-day, you can either have a packed lunch, something like a sandwich, some fruits, some raw veg or if the school provides food, you can have food at the school. When you come out of school in the afternoon, if you're hungry, fruits, breadsticks, carrot sticks, dips, things like humus or tahini and then an evening meal, which is based on meat, fish or chicken, different vegetables, small potatoes. The smaller the potato, the longer it takes the body to break them down. Lots and lots of children love pasta, if you're going to have pasta, not too much. But also, make sure it's mixed with a meat and a vegetable, so things like lasagna, Spaghetti Bolognese, as a meal would be ideal. Other thing you need to think about in this day and age is not too much television. A child should select one program, not be sitting in front of a television for hours, and also, computer games, use of the computer should be limited to thirty minutes in a sitting. The reason being that that area of brain we talked about earlier, the anterior cingulate, there's a particular part of it where if you stay on the computer too long, then you start to become obsessive, and that's why children are so difficult to get off the computer when they're playing a computer game, and why some adults will stay up all night because they've got to get to the next level of the game, the next level, the next level, the next level. Even though they've got to go to work in the morning, they'll be on the computer playing games all night. So you have to start off the discipline right at the very start and limit the amount of television, limit the amount of – because it is mindless, just watching endless television. But also, limit the amount of computer time, computer games in particular that the child is playing.

Dr. Yannick Pauli: Great. As far as the supplements, are you recommending any specific types or just the general multivitamin, multi-mineral is enough or...?

Dr. Robin Pauc: Well, the thing is that you have to be twelve years of age to have an adult dose in the UK. So basically, what I suggest is children under twelve, they need to have something that doesn't contain artificial sweeteners, doesn't contain artificial colorants. So you have to search around depending on which country you're living in to find a product that will give you the right dose for the child's age. It has to be an age appropriate dose. So in the UK, we use Kindervital for the vitamins, and we

use Floradix Saludynam for the Zinc and Magnesium because that can be given as an age appropriate dose. Over twelve, it doesn't matter as long as it's a reputable brand of vitamins, and then it's got adequate Zinc and Magnesium in it. If not you need to supplement the Zinc and Magnesium so again, for anyone who's really, really interested must know exactly what the doses are. It's all given on my website and the diet, so we've got everything on there that you could possibly wish to know.

(www.tinsleyhouseclinic.co.uk/diet)

Dr. Yannick Pauli: Perfect. And we'll give the link to your website to the listeners.

Dr. Robin Pauc: Okay.

Dr. Yannick Pauli: Any recommendations as far as moving your body around, physical activities, some sports that would be better than others?

Dr. Robin Pauc: One of the things we find very useful for children with behavioral disorders is the context for things like karate. Now, you may think that if you've got a child that's got ADHD and he's already too active and in your face and what have you, giving them something like karate could be a danger. But in actual fact the discipline that's involved in these martial arts is great. And what happens is that the children soon learn that they have to do as they are told, and they do. It's quite remarkable. So if you've got a child with a behavioral disorder, think about the martial art. Most children these days, and it's certainly the case here in the UK, most children are having a tendency to be overweight, so you need to watch the diet and you need to seriously increase the amount of exercise they're getting. Now, what you need to do is provide two or three different forms of exercise, not just one. So swimming, cycling, football, you know, a mixture of things rather than concentrating on one thing because what happens is if you do, say, just cycling, you get fit to cycle, but when you tried to swim, you find that you get out of puff very quickly. So what you need to do is different types of sport to exercise different parts of your body in a different mode.

Dr. Yannick Pauli: Very, very interesting. Thank you for sharing that. What I would like you to cover maybe now is can you give us a sense of when someone comes and see you for an examination for children, some of the things that you are looking for and some of your recommendations as far as treatment plan. And one thing, well, to be a little bit more precise, we talked about how different part of the brains were delayed in their development, I'd love for you to talk a little bit about the role of convergence of the eyes, and how that is important and how frequently problematic it is in children.

Dr. Robin Pauc: Okay, right. I can tell you about two things. One is convergence insufficiency, convergence failure. But also, the other one is a problem in an area of the brain called the magnocellular area which can lead to a misdiagnosis of attention deficit. But let's talk about convergence first of all. Basically, what we're talking about, convergence is the ability to bring both eyes in towards the nose very accurately. Now, what you want, if you're doing any close work, if you are reading, writing, whatever, you need both eyes looking at the same target on the page. Now, what has to happen

is that the image that you are looking at has to be projected onto the same part of the retina in each eye at exactly the same time. And that part of the retina is being called Panum's area. Now, Panum's area isn't a physical area. It is a degree of accuracy. So if one eye is slightly out; the brain will cope with it. But if one eye is out, so it's beyond Panum's area, the brain can't cope. And it's been suggested that what happens is that the aberrant eye, the information from that aberrant eye is suppressed. So effectively, you're only looking, reading, doing your sums with one eye. Lots and lots of people have done research on this, and what they found that in a great many children. Now, I'm rather conservative, and I say probably thirty percent plus. Others have had fifty percent, sixty percent. Now, what this means is you can simply test, you can get an object, a pen or something and bring it in towards the child's eyes, and both eyes should follow that pen as it comes in towards their nose accurately. And as the pen moves away, the eye should then go into divergence, move away from the nose. Now, a great many children in particular will struggle to do this. They will either struggle to bring their eyes in at the same time or and it's usually the left eye. The left eye will fail. It will flick back out. Now, imagine if you're reading, you've got to bring both eyes in to look at the first word on the page, and then you have to move your eyes while still in convergence, still being held in towards the nose. You have to make the move across the page like windscreen wipers. Now, that is an incredibly difficult thing for the brain to do, is one thing just to make the two little muscles on the inside of the eye, pull the eyes in towards the nose. But to have one contract still more, one contract still less is really, really difficult so you can keep both eyes exactly in the same place on the page. Now, what they found, and here research that has taken place in the UK at the present time is that what happens is, one eye looks at the beginning of the word, one eye looks at the end of the word. The brain fuses it together. Well if you've got one eye that's not doing its job, then the brain isn't going to be able to fuse it together, and therefore, you will appear to have dyslexia. Now, there are very accurate ways of measuring how accurately the eyes move in and out from the nose into convergence and divergence. There are easy, easy ways to do that. There are even computer generated programs that can monitor what the eyes do while you are actually reading. What we find when you do that is that the child that is struggling to read because of convergence insufficiency will make too many movements of the eyes right to left; in other words they are reading backwards, which explains why so many children reverse letters. Because if you are reading bed, it's B-E-D, when the eyes go backwards, the D becomes a B, E is the same, but the B has become a D. And so it's all very confusing for the poor brain. So if we can identify this convergence insufficiency or convergence failure, we can treat it in a matter of weeks, and the child's reading ability will then improve dramatically. And I've got a campaign running at the UK at the moment because I want every child in the country to be tested for convergence insufficiency round about six years of age. So when they go into school, start to learn to read, we want to know, can they converge, can they diverge their eyes accurately, have they got smooth tracking because without that, they're not going to have reading fluency. I think that probably thirty to forty percent of children currently diagnosed as Dyslexic, can be treated effectively within a matter of weeks. And imagine, the burden that will be lifted from Special Need teachers in schools and the burden that will be lifted from government if they don't have to payout all this money for looking after

children that are supposedly Dyslexic when they’re not. That’s one thing and that’s one of my passions to look for this in children as every child should be tested for it.

The other thing is that there’s an area of the brain, there’s one on each side, in the parietal cortex towards the back of the brain and it’s called the magnocellular area. And the job of the magnocellular area on the right is to monitor what’s happening in the peripheral fields on the left. The magnocellular area on the left does the opposite, it monitors what’s happening on the right. Now, when you’re a little child, you have to, we say, below four years of age. If anything moves in your peripheral vision, you have to look at it because it could be a danger. If you imagine going back to the time when we lived in caves, you know, your mother might put you down on the floor, a wolf or a bear or something turns out, you’ve got to see that it’s there, scream, and then hopefully, your mother protects you. Now, imagine if that situation were to remain in a child if, say, seven, and he is in the classroom full of other children that are moving around doing things, people walking past the classroom, birds flying past the window, if that primitive response is still there that it should go round about four years of age, if it’s still there, you’re going to be distracted by everything that happens in your immediate environment, so you will appear to be – to have attention deficit. Now, the interesting thing is, it is the magnocellular area on the right side of the brain that ultimately decides whether you’re going to look at something or not. And what we’re going to find, well, certainly what I find, is that the vast majority of children with learning and behavioral problems, the problem is on the right side of the brain, the right side of the brain is not developing at the rate that it should do because the way that the brain works is basically by inhibition of inhibition. Now, if you’ve got areas of the brain that haven’t developed, you can’t inhibit the next area of brain or if that area of brain beyond has not developed, is not doing what it should be doing so you can’t inhibit it or you can’t excite it. And so therefore, this whole thing about the post-natal development of brain and the epigenome I think is absolutely crucial to our understanding because we’ve got to have the two sides of the brain working together. You want the right brain doing its job, the left brain doing its job. They have to do it together. And so often, when the right side of the brain glitches, when it’s slow to develop, then you can have an appearance of the left side of the brain is failing, but it’s not. It’s just that the right side of the brain is not doing its job as efficiently as it should do. And it’s working out of sync with the left side of the brain. So these two things there which can be easily identified and treated in a matter of weeks.

And yet, these things are not generally known, so as we said earlier, Von Economo neurons are not known to most people. I’ve got a sitting behind me is a wall of books. And within that wall of books, there are two books that actually mention Von Economo cells. All the others ignore them. So we need to be spreading the word about Von Economo cells. We need to be spreading the word to parents about convergence insufficiency. And also, we need to look at children that appear to have attention deficit and find out if they’ve got this primitive defensive retained reflex. If they have, it can be treated as I say in a matter of weeks, and the child could then settle down and get on with their work.

Dr. Yannick Pauli: You said that convergence failure was easily identified with software program, how easy or difficult is it to evaluate for this retained primitive visual reflex?

Dr. Robin Pauc: Right. So convergence insufficiency can be easily measured. There are computer programs, a lot of opticians, ophthalmologists, whatever, optometrists use them. Basically, it relies on generating a random dot stereogram, a 3D image. So the child or adult would put on 3D glasses and then the computer challenges them to see images, 3D images that are harder and harder and harder to see. So the computer measures in fractions of the diopter, just how well you're converging, diverging. So you would do that test and I do it two or three times to make sure that you're not just having a bad hair day. If the readings are similar each time, so three consecutive readings on different days, then what you can do is use a computer generated program that the child or adult uses at home on a daily basis that slowly, gently increase the difficulty of seeing 3D images. And what happens is, because there's an argument, because the opticians say, "Well, this is an eye problem, and you people shouldn't be treating it, and I answer no, no, it's a brain problem." Because it is the brain that controls the muscles that control the eyes, so therefore, it's a brain generated problem. So in terms of convergence insufficiency and failure, it's very much a brain problem. No one is a hundred percent sure where it originates. One of the primaries I think is probably in the paravermal zones of the cerebellum, so it's a cerebellar problem, but there are other areas of brain as well which are involved. So that's one thing that could be treated. The other one, the primitive reflex, defensive reflex in attention deficit, that's a right magnocellular area problem, and that can be addressed by using something that will employ the frontal part of the brain, frontal pole, so something like a searching activity, while a stimulus is put in the left eye, which will crossover to the right side of the brain and will stimulate the right magnocellular area. So there are computer programs which are specifically designed to measure these problems and also to treat them.

Dr. Yannick Pauli: Very, very interesting. Anything else you would like to add as far as you've talked about two very important dysfunctions that are easily identified and easily treated, any other things in your experience that health care professionals or parents should be aware of?

Dr. Robin Pauc: No. I think really what parents need to think about in particular, because they can deal with this, is they can look up to the diet that their child is eating. They can look for artificial sweeteners. They can look for e-numbers, chemicals that are added to the food. Again, there are books on the market, let me think, one of it's at the top of my head, 'What's Really In Your Basket?' This book gives you a color code traffic light system, red's are no, no's, amber is watch child, greens are okay. It will tell you the chemical name. It will tell you the e-number. It will tell you what it's going to do to you. It's going to tell you where you're going to find it. The front of the book is all about the foods that we eat. The back of the book is about cosmetics, so toothpaste, shampoo, deodorants, and all the things that come into contact with our body. So one you need to become a bit of a food expert, so parents need to look at the labels of the foods that they're purchasing, they need to be aware of how much fat

their child is consuming. What sort of fat is it? They need to be aware of how many carbohydrates the child is consuming. They need to be aware of hidden sugars, salt. Now, for instance, you have a deep pan pizza, you could exceed your daily allowance of salt. Now, and you I think well, how can that be? Some of the very well known companies that provide things like hamburgers, chips, and things, apparently, they coat the chips in sugar, salt, and beef extracts. So if you're a vegetarian, don't eat chips. So basically, this is to enhance the flavor and to make them crispy, but most people wouldn't know that. They think well chips are okay, they're just potatoes, aren't they? But they're not. They're coated. So one you need to look at diet, you want to try and have a diet that will keep the blood sugars level as possible, because one of the things that developing brain needs is oxygen, a regular supply of food, so you want your blood sugar levels to remain the same. And one of the interesting things that somebody said a few years ago is that, a French neurologist, he said the third thing that the brain needs is love. Well, it's not too difficult to love your children, but sometimes, parents give them a bad diet, thinking, well, they're being kind to the children, too many sweets, too many fizzy drinks, too many chocolates, too many fats, too many carbohydrates. So you need to – parents can look at the diet really, really well, that will help. And also, as we said earlier, they can think about supplements, Omega 3, Vitamin C, B-Complex, Zinc, and Magnesium at an age related dose. Those things parents can do. Parents can also make sure that their children are having enough general exercise. If you're worried about an issue of behavior with the child, then the thing to do would be to give them something like a martial art, which empower them. It actually brings them into line because there's a lot of discipline in using your body in a martial art, so you have to learn coordination and balanced timing, but also, the discipline of who you use violence against, very important in the martial arts, so that can be done.

From a professional's point of view, more and more professionals need to know about the post-natal development of the brain. There are so many things that are being discovered now, so you need just recently that for instance, the developing brain is being mapped. A few years back, if you say well – does this brain – is this brain normal? I'm looking at a scan, is that what it should look like? The answer would be, “I don't know.” But now, there are atlases that are being developed so you can see. For each age of the child when they're two, when they're four, when they're six, when they're eight what the brain should look like, so we need more research like that. But we also need more awareness of the immediate post-natal developments of the brain. We need to know about Von Economo neurons, we need to know about gigantopyramidal cells. We need to know about calcium binding keratin cells. I mean, these have been implicated in vocalization and facial expression. Well, one of the two most common ticks that a lot of children, even supposedly normal children have, blinking, grimacing, and minor vocal tics. Now, are these cells implicated? We need to look at those things in great detail. Most people wouldn't realize that say for instance, between puberty, and sixteen, the number of connections in the brain, the number of synapses will double. From sixteen to nineteen, basically, the synapses, the connections we've not been using that frequently, we're going to lose. They're going to be pruned back. There are very, very important times in the development of children, the professionals

need to know about. And now, the brain isn't complete at birth but it's far from it. So the old idea, the brains there, it's just got to get bigger, it's got to grow, you know, get a few astrocytes, not the case. So we need to know more about the second generation brain cells like the Von Economo cell. We still know, but as far as when I was touched on astrocytes, the other brain cells that we have that have to be there at the synapse, for the synapse to function. So we don't know about the astrocytes that are involved in the function. And they must be specialized for that second generation. We don't know anything about them, when they develop, how they develop; are they different from other astrocytes, so we need more research in that area. Basically, parents can help with diet supplements, making sure their kids get exercise. Practitioners need to be aware of the post-natal developments of the brain. They also need to be aware of co-morbidity. Don't go for the simple solution. "My child is very active. Ah, it must be ADHD." "My child can't read. It must be dyslexia." Look at the big picture, be holistic. Look at the whole developmental history. Look at the pregnancy, the labor, the delivery, the developmental milestones; Look at the early academic history to see what's going on. Ask questions about, did the child struggle to dress themselves? Is it fine motor skills? Gross motor skills? Did they struggle with the scooter or tricycle or bicycle? Have they been accident prone? Have they been clumsy? Are they messy eaters? Do they have poor spatial awareness? Ask all sorts of questions to bring out answers about dyspraxia, about short-term memory, about attention. Can the child concentrate? Can they be easily distracted? You need to ask questions to find out about the other co-morbid areas and don't, say, fall into the trap of thinking of these things as being conditions. Think of them as symptoms, symptoms that will always appear together, ask questions about the symptoms, and then you'll get a good picture as to how the brain is working or how the brain is malfunctioning due to some glitch in some area. Then it becomes fixable because you can direct your treatment at specific areas of brain.

Dr. Yannick Pauli: Great. Well, thank you so much for these explanations. In the last minute or so that we have, is there any question you would have wished I had asked you?

Dr. Robin Pauc: No. I think you've covered the subject very, very well indeed. The other thing I would say is that for parents who want to know more about it, as I mentioned earlier, they could visit my website, there's host of information on that. YouTube, there's a selection of videos where I talk about specific subjects. And also, as you mentioned earlier, there's the books out there which are available in Arabic, Korean, Spanish, numerous languages, Japanese, English, American. Empower yourself as a parent to find out more about diet, more about brain development, and what you can do as a parent to help your child because basically, you won't be able to do it all. But you should be able to find a practitioner that's available to help you, to give you advice, to guide you in helping your child to overcome these difficulties.

Dr. Yannick Pauli: Great. And we will definitely give the reference to your books and to your clinic here on the websites where people are listening to this recording or in the transcript of this recording. Dr. Robin Pauc, thank you so much. I really appreciate

you being on the call and sharing with our listeners, please stay on the line while I am saying goodbye to our audience. I really appreciate you sharing your knowledge and wisdom. This was Dr. Yannick Pauli for the Unritalin Solution, our interview series “Greatest Minds on ADHD” with Dr. Robin Pauc. Thank you so much, Dr. Pauc.

Dr. Robin Pauc: My pleasure.

Resources mentioned in the Interview

Dr. Robin Pauc’s Books



The Learning Disability Myth is the US version of “Is that my Child?”

Additional Resources

If you would like to listen or download Dr. Pauc’s interview or to find more free interviews of the “Greatest Minds on ADHD” series, please visit:

<http://www.unritalinsolution.com/adhdinterview>

To access other written transcripts and other free ebooks about the natural management of ADHD, dyslexia, autism and other neurobehavioral disorders, please visit:

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About

About Dr. Robin Pauc:



Dr. Pauc is a Chiropractor who graduated from the Anglo-European College of Chiropractic in 1974. He’s also a diplomat of the American Chiropractic Neurology Board and a Past Assistant Professor of Clinical Neurology. He has been in clinical practice for over thirty years and now has a special interest in developmental disorders in children. He is the Director of the Tinsley House Clinic in the UK, and had established treatment centers across the UK and in several foreign countries across the world. His clinic is an accredited research clinic and he has published several research papers in peer-reviewed journals. He’s also the author of three books for the public: “Is That My Child?,” “The Brain Food Plan,” and “Could It Be You?” which are now available in six languages.

About Dr. Yannick Pauli



Dr. Yannick Pauli is a chiropractor who has advanced training in functional neurology, nutrition and functional medicine. He also has advanced education in chiropractic paediatrics. He is the Director of the Centre Wellness NeuroFit in Lausanne, Switzerland. It is in this clinic that he runs Brain Potential, a holistic brain-based stimulation program that integrates various therapies to help children suffering from ADHD, dyslexia and other learning disorders, as well as other developmental disorders such as autism. Dr. Pauli has served as an expert on chiropractic and alternative and complementary medicine at the World Health Organization, was the 2004 recipient of the World Chiropractic Alliance “Chiropractor of the Year” Award and has published research on the effects of chiropractic on children suffering from dyslexia, as well as the effect of Network Spinal Analysis (a low-force approach to chiropractic) on the ability of adults with ADHD to concentrate. He is also the founder and current president of the Swiss Chiropractic Pediatric Association. He is the founder and chief editor of www.unritalinsolution.com, one of the fastest growing online resources about the natural management of ADHD and related disorders. Dr. Pauli is married with Cecilia and has two children: Noah and Megan.