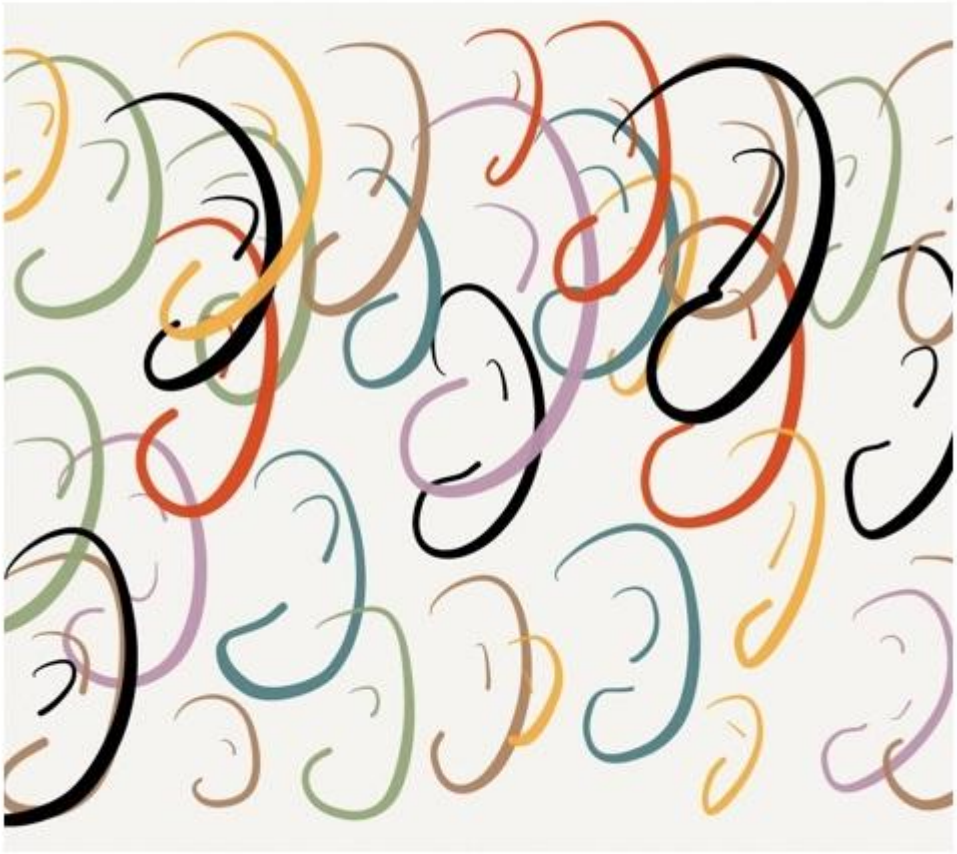
VIDEO INTERVIEWS WITH A SPECIALIST

Auditory Processing Disorder



DEVON BARNES

About the Author

Devon Barnes is the Clinical Director of the Lindfield Speech Pathology & Learning Centre which she established in Sydney, Australia in 1990. She has worked with children and adults with speech, language, literacy and learning problems for over 40 years.

In her clinical practice Devon leads a team of professionals including 8 speech pathologists as well as child psychologists, paediatricians, and occupational therapists. She has extensive experience working with children and adults with various language based learning difficulties including dyslexia, auditory processing disorder and autism spectrum disorders.

Devon regularly attends conferences in Australia and overseas, seeking out the latest research and treatment strategies.

Devon is also a frequently invited speaker at Australian and international conferences, including the International Dyslexia Society Conference – Chicago 1999, First Asian Brain Based Learning Conference – Singapore 2005, Australian Speech Pathology Conference Sydney & Melbourne 2006, the Rewiring the Brain for Academic Gain Conferences – Sydney, Melbourne and Canberra 2007, and the Dyslexia Association of Sarawak Inaugural Conference in Borneo 2010.

Before she established her clinical practice, Devon worked in the public and private sectors with adults and children as both a speech pathologist and an audiologist. She has worked in hospitals, schools and community health centres where her focus was managing children with learning and associated emotional difficulties.

She also worked in special schools where she treated children with hearing impairment, developmental delays, and language and learning difficulties.

In the hospital environment she treated adults with neurological impairment resulting from head injuries and strokes.

Devon has personally treated many children, adolescents and adults with Auditory Processing Disorder, helping them to understand their condition and to improve their ability to process speech sounds.

Chapter 1

What is Auditory Processing Disorder?

In this first interview, Devon outlines the basic description of auditory processing disorder in simple language. This interview provides the basic insight required to prepare for dealing with auditory processing disorder in various contexts, such as at home or in the classroom.

What is Auditory Processing Disorder?

Q: **Devon Barnes, welcome.**

Devon: Thanks very much.

Q: **We're talking about Auditory Processing Disorder.**

Devon: One of my favourite things to talk about.

Q: **Can you give us a very simple definition?**

Devon: Auditory processing in itself refers to what we do with what we hear so it is separate from actual just hearing. We can refer to hearing as 'hearing acuity', what's the very softest sound that I can hear across a range of frequencies. When you go to an Audiologist and have your hearing tested they're testing your hearing acuity.

Q: **So, are we talking also about loudness?**

Devon: Absolutely.

Q: **So, not just frequencies low and high but exactly how loud they are?**

Devon: That's exactly right, and what is the softest sound we can hear is our hearing acuity.

Q: **Right.**

Devon: Whereas auditory processing is then 'what does the brain do with what it hears' particularly in relation to distinguishing speech.

Q: So you've defined what auditory processing actually is, but we're talking about Auditory Processing Disorder. So what goes wrong ?

Devon: So, Auditory Processing Disorder in its simplest form is, when something is wrong with what we do with what we hear, so it could be that we have difficulty perceiving speech when there's background noise or we have difficulty locating where a sound is coming from or, we have difficulty distinguishing between similar sounding speech sounds. So, Auditory Processing Disorder covers a variety of different symptoms, if you like.

Q: So the acuity can actually still be okay?

Devon: The acuity can be absolutely fine and in fact we only describe Auditory Processing Disorder when we know that the person has perfect hearing because otherwise we're looking at a hearing loss and you can still have similar symptoms but they would not be classified as an Auditory Processing Disorders but those symptoms would relate to having a hearing loss.

Q: Is it a common problem?

Devon: I think it's more common than acknowledged, particularly in schools, because it's a relatively new disorder that's been described over the last 20 years. One of the problems is that even amongst the academics there's no common agreement regarding exactly what is Auditory Processing Disorder.

Q: So, a little bit of a mystery then. Is there any particular research coming out at the moment which is helping us with that understanding?

Devon: There's a great deal of research into this disorder and I think that is helping to clarify what we actually mean by Auditory Processing Disorder but as a field it's really still in its infancy compared to things like Dyslexia and ADHD which have been well described for, you know, 50, 60, 70 years, whereas Auditory Processing Disorder has really only come on our radar in the form that we're developing, in the last 20 years.

Chapter 2

Indentifying Auditory Processing Disorder at Home

In this chapter we look at auditory processing disorder in the home. What are some of the ways we can identify it, and how should we respond if there is a problem?

Indentifying Auditory Processing Disorder at Home

Q: **Devon, looking at Auditory Processing Disorder and the home situation now, what are the early signs that your child might actually have Auditory Processing Disorder?**

Devon: Well I know a lot of parents complain that their children don't listen or that they ignore them. Now, for our child with Auditory Processing Disorder it really could be that they, in essence, don't hear what the parent says, or, it's not that they don't hear it's that they don't process the instruction as they should so that then they don't respond in an appropriate way.

Q: **I guess it would be very easy for a parent to say, 'My child doesn't listen to me' so again, similar to the classroom situation, maybe we need to give them a break and allow a longer time for them to respond?**

Devon: Yes, well if the parent is aware that the child has an Auditory Processing Disorder then that's a very good strategy but many parents will just complain that their child doesn't listen or doesn't respond, not being aware that the child actually has a problem and that can end up in a distressing situation for both the child and the parent because the parent might be reprimanding the child when in fact the child is doing the best they can.

Q: **Do you find that sometimes children do unpredictable things because perhaps they only heard half the instruction?**

Devon: Indeed they do, for example, a parent might say to a child, 'Please don't put your shoes on the table' but the child only hears, 'Put your shoes on the table' and so the child will do exactly the opposite to what the parent has requested because they've misinterpreted that instruction.

Q: **So, it might actually be really difficult to diagnose the problem or think that there's a problem because you're too busy just getting frustrated about the fact that the child has done something irregular or unpredictable?**

Devon: Exactly, that's right.

Q: **Do we find some of the symptoms are the same as in the classroom like background noise in the home?**

Devon: Yes that very much can be a problem and we know these days lots of families have their television on all day.

Q: **Yeah, I was going to mention that, is the television in the background a problem?**

Devon: Yes it is, particularly for our child with Auditory Processing because if, you know, mum's asking them to go to their room and do something specific or collect something from their room and the television is on, they're not going to be able to process what the mother or the parent has asked them to do.

Q: **I know in one of our earlier discussions you mentioned that children sometimes cover their ears when they're being shouted at, is that actually causing them discomfort, does it cause them pain, or is it just a frustration reaction?**

Devon: I think it's not so much a physical symptom, it's more a psychological symptom because the sound really bothers them and it's really hard to tell in a young child if it does cause pain, but it's more that it just distresses them, it's just irritating to the child and so they want to block out that background noise.

Q: I guess perhaps another source for irregular behaviour, if that was the case?

Devon: Yes, yes, and it would be a red flag to a parent that if a child is constantly putting their hands over their ears, something is not right and they need to seek some professional advice about that.

Q: How would a parent know whether it was an Auditory Processing problem or a hearing acuity problem, would they have any idea as to whether it was which one?

Devon: I don't think so, so that's why it's really important, number one is to get the hearing checked before we do anything else, particularly for a child that's had a history of multiple ear infections because we know that when the brain needs to be processing speech, and hearing speech clearly to develop the auditory pathways, recurrent ear infections interrupt that process. So, if a child has a history of recurrent ear infections that's more likely, that child is more likely to possibly have an Auditory Processing Disorder.

Q: When we think about all these symptoms combined does that also sometimes lead to memory loss? Do children just forget what to do? Do they just listen to so much and think, 'I don't understand it, I'm just not going to do it' and then just forget?

Devon: That happens at home a lot. I think that switching off behaviour very similar to the classroom, that the capacity for the brain to hold onto what a child hears is very much reduced when you have Auditory Processing, and so when the brain goes on overload the child will just switch off and stop listening because they just can't process anymore information and of course the parent could see that as disobedience or being oppositional whereas in fact the child just cannot take in any more information.

Q: Let's say that you didn't think that your child had any sort of auditory problem at all yet they didn't like going to school or they were hesitant about going to school, could that be a signal that something is not right?

Devon: Exactly, and so then a parent really needs to take action there and try and – you know, they might even start off with their GP. If a child is starting to become reluctant to go to school, or we know that they're not happy at school, and whatever is causing that distress needs to be investigated.

Handling Auditory Processing Disorder at Home

Q: Devon, we've established then perhaps that there's a problem with Auditory Processing at home, what can parents do to help?

Devon: First and foremost I think I would advise parents to have a lot of understanding and compassion so that it eliminates frustration for the child and also for the parent, so understanding that sometimes the child won't respond immediately or will respond inappropriately. So some simple things a parent can do is, when they need the child to listen and follow an instruction, make sure they have the child's attention, have the child facing them and always keep their instructions short. Don't give the child lots of things to do with one long instruction.

Q: And this refers back to what we were talking about before by giving them some space to answer or some space to respond to the instruction?

Devon: Yes, yes, and don't get frustrated if they don't do the thing you've asked them to do immediately, and then you can even ask the child to say, 'Now, what does mummy want you to do?' 'That's right, go and get your school bag from the laundry' and so check that the child has actually understood.

Q: Okay, so reinforcing the fact that the instruction was correctly understood?

Devon: Understood, that's right.

Q: Okay, so one of the harder ones, what about the television, do we turn it off?

Devon: I think you do limit the amount of television that children are exposed to, particularly during the school week because I think, you know, it interferes with homework time and we know that they need a very quiet environment so I would definitely be advising limiting television during the school week, particularly in the morning before school, I think that's a big trap to let children watch television before they go to school because I think they need that quiet time. They also need a routine in the morning so if the child has half a dozen things to do to get ready for school rather than rely on a spoken instruction, a parent can actually have a chart

with the visual representation of each task so, get up, go the bathroom, put my school uniform on, pack my bag, do I have my lunchbox, do I have my sports shoes, and actually have a picture of all those things. Then they can check those off each day and so that makes those jobs get done with less distress.

Q: What about talking to the school?

Devon: That's very important so I think the maximum amount of communication parents can have with the school, the teacher, the special needs teacher, and any other professionals involved in the child's care, for example, the child may be also seeing a speech and language pathologist, and so the optimal outcomes will occur if there's maximum communication between the parent, the school and any outside agency involved.

Q: If a child is receiving treatment and a parent is working with a speech and language pathologist and is talking to the school, do we have any idea as to how long it takes to get any improvement?

Devon: It's hard to say but I would say the better the communication and if we're all on the same page as we speak, the outcome for that child is going to be much improved.

Q: So you probably wouldn't want to just talk to the special needs teacher, you'd probably want to talk to all of the teachers I would suspect?

Devon: Yes, and particularly the classroom teacher and the special needs teacher and even the sports teacher, any teacher that child is interacting with.

Q: Is it a case where that particular student might have to seek special provisions at exam time perhaps? Is it worth going down that path or can we work through that in the normal situation?

Devon: I think the special provision issue has to be made after the child has had some intervention for several years and to see where they're at after that intervention but if they're still struggling particularly with their literacy skills or taking in information we need to consider those special provisions.

Q: **If a parent had a suspicion that something was not quite right, how long would you let something like that go before you did something like make an assessment, or have the child go through an assessment?**

Devon: I think as soon as you're aware that the child is struggling you would hopefully want to make some approach to some professional to start the ball rolling really and the first person I would speak to is the teacher, because teachers know, I mean, teachers know very early on when a child has a difficulty. Experienced teachers will tell you, they can tell you in the first term of kindergarten if your child has an issue.

Q: **But do you find that in all of the people that you've spoken to and met who are involved with this problem over the years, is there a bit of a taboo about this, do some people find this hard to talk about?**

Devon: I think there are some professionals who still like to see Auditory Processing as just part of the wider issue of Attention Deficit but we do know that for those children with Auditory Processing it is very much a problem related to perception of the speech signal, the auditory signal, and it is distinct from Attention Deficit. Some children can have both difficulties but it is very much a distinct problem with distinct remediation strategies that are needed.

Q: **So parents should waste no time?**

Devon: Absolutely. The best outcomes will come with early diagnosis and appropriate intervention.

Identifying Auditory Processing Disorder in the Classroom

In this chapter we look at auditory processing disorder in the classroom. How can teachers identify students that may be suffering from auditory processing disorder? How can schools modify their classrooms and teaching methods to better accommodate children who suffer from auditory processing disorder?

Identifying Auditory Processing Disorder in the Classroom

Q: **Devon, getting straight into the practical sides of what to do with Auditory Processing Disorder, how might we recognise it in the classroom?**

Devon: One of the most common features would be that a teacher would notice that a student – there's a delay before they respond to a question or an instruction, so the teacher might say to the student, 'Get out your Maths books and find chapter 3' and your student with Auditory Processing Disorder will just be sitting there for a few seconds thinking, 'What did she ask me to do?' They might even look at their neighbour to see what they're required to do so one of the most common things is a delay in responding to an instruction. Quite often they will mishear an instruction so they might do the wrong thing because they haven't processed the instruction correctly.

Q: **So straight away a practical thing for a teacher might be to, say, wait a little bit before perhaps repeating the instruction, just to see whether the answer or the action is actually about to come?**

Devon: That's exactly right because quite often these children, it's not a question of them not understanding what the teacher said but they just are slower to process that information so waiting is...

Q: And we just don't give them the chance?

Devon: That's right, that's right. Also, a child with Auditory Processing one of the most common symptoms is that they're often very bothered by background noise, so if there's extraneous noise in the classroom they'll have much more difficulty processing what the teacher is saying.

Q: So, acoustic treatment of classrooms would be a pretty good idea?

Devon: Very much so and quite a simple thing to do these days. Another issue for children with Auditory Processing is that it can very much impact on their literacy skills, so one of the major difficulties when you're learning to read and spell is to be able to hear sounds in words and distinguish sounds in words. For many children with Auditory Processing Disorder that's a major difficulty for them so it impacts on their literacy skill development.

Q: Related to that I suppose might be their social development, how they perceive different types of language like compliments or sarcasm?

Devon: Exactly, because Auditory Processing Disorder is very closely associated with the perception of language so if you're not processing what you're hearing you will have difficulty with aspects of language so one of the issues in Auditory Processing is that difficulty in understanding differences in tone of when we're spoken to, so they might confuse a sarcastic comment with a criticism. So if a teacher is saying, 'Gee that was smart', compared to 'That was smart', your child with Auditory Processing isn't going to perceive those fine differences and they can feel very upset with a misinterpretation of a message.

Q: With perception of language I guess accents would come into that as well if a student had a teacher with a very heavy accent?

Devon: That can be a huge problem for a child with Auditory Processing because one of the other difficulties that's been very well documented is that when the speech signal is in any way – we use the word 'degraded', it just means that the signal is not ideal so that could be a teacher with a foreign accent, a teacher with a hoarse voice, the teacher just has a cold or laryngitis and so the speech isn't going to be as clear as normal so that will impact on a child with Auditory Processing Disorder. In fact I had a student this year who had to be moved out of a class purely because the

teacher had a foreign accent and he just could not cope in that classroom, whereas the other children didn't have a problem.

Q: So what would you say to a teacher who might think that there could be some problems in the classroom but they're not really sure what to do or maybe they don't know whether they're just trying to guess too much as to what the problems might be? What's the next thing a teacher can do?

Devon: I think in an ideal situation the teacher then needs to speak with the parent and maybe, if possible, organise an assessment for the child and in that assessment we need to look at quite a few things. First of all we want to make sure that the child can actually hear and then we need to look at their language skills and possibly their cognitive skills and then possibly have a specific assessment for Auditory Processing Disorder if they can access that.

Q: What about daydreamers?

Devon: Well, they're an interesting group of children and there's...

Q: I mean, I like to daydream, does that mean I have Auditory Processing Disorder?

Devon: Not necessarily. I think daydreaming can be the result of three different conditions and very often hard to distinguish between the three. Sometimes very, very bright children, very gifted children are lateral thinkers and so they'll have an idea and then their brain will just go off with a new idea and that takes them off into this wonderful world of ideas. Then you have your child with ADHD, inattentive type, who just cannot sustain their focus for any length of time in the classroom and that usually applies to any activity whether it's auditory or visual or whatever they're doing. But a child with Auditory Processing Disorder can appear to daydream but what we find is, they'll only switch off when they're having to deal with a lot of verbal instruction, verbal information. So, it's like their brain just gets overloaded so, once the brain is overloaded with auditory information and cannot process one more iota, then they will appear to switch off and daydream but in fact it's just because their auditory system has reached its capacity for that point in time.

Q: Daydreaming is, I guess you could say, a passive response, does it go the other way as well? Like, do the students sometimes go a bit crazy?

Devon: With Auditory Processing? I think, particularly the students that are very bothered by background noise and continually frustrated because they're missing a lot of what the teacher is saying. If there's a classroom discussion they get very lost in that as well and so that can be very distressing and they're not achieving as well so they can often get very upset. Some children will even cover their ears because they're so bothered by background noise, or they might even cry or hit out at other children because of the distress that they're suffering because of their disorder.

Q: So they might not actually just be badly behaved, they've really got a problem and they need help.

Devon: Absolutely and I think for teachers, any child with any behaviour problem there's always a reason. No child misbehaves for no reason. So it's the challenge for the teacher then to try and understand where that behaviour is coming from.

Q: That's a bold statement but I guess you've got some 40 years of experience in being able to form that opinion?

Devon: Absolutely, absolutely.

Q: You seem pretty confident of that?

Devon: Absolutely without question. All behaviour comes from something, whether it's anxiety - many children behave very badly because they're anxious about something, it could be a social situation at home, it could be about their learning, it could be about many things and to me, all behaviour comes from some source. Children are not born naughty.

Q: Now, you've got a whole bunch of strategies that we can use in the classroom but we'll come to those in another video. Devon, thank you.

Devon: My pleasure.

Handling Auditory Processing Disorder in the Classroom

Q: Devon, we talked briefly about what the symptoms are in a classroom, if you're a proactive teacher or if you're in educational administration and you want to do something about your classrooms, what could you do?

Devon: There are lots of things you can do. So, first of all, we would want to look at the physical environment; we have to try and reduce the amount of extraneous noise as much as possible, so really simple things like having carpet on the floor, rubber tips on the bottom of chairs, corkboards and cloth boards to absorb noise, and then for our child with Auditory Processing where are we going to seat that child? So, we need to seat the child quite close to the teacher so that the teacher can check for comprehension and make sure the child is understanding instructions, so she can give those subtle checks. So we don't want our child with Auditory Processing Disorder up the very back of the room where the teacher is not going to have access to checking for comprehension.

Q: Some schools have moved completely away from desks in rows, is that a good approach?

Devon: Well actually for our child with Auditory Processing it will depend again on where we seat them. They really should be ideally facing the teacher because if we have our children sitting around desks in clusters you're only going to get a quarter of children at each table facing the teacher if the teacher is standing at the front of the room. So, for our child with Auditory Processing it's not the best way to seat the child.

Q: And do we need to be that concerned that we start thinking about other noise, like noise coming from outside the classroom or air conditioners or fans and things like that?

Devon: Absolutely, our child with Auditory Processing we know one of the most distressing symptoms for them is dealing with background noise and so we need a child with Auditory Processing away from fans and air conditioners and traffic outside, so not near a window that's, for example, on a busy road, not near a corridor where you have other children running up and down shouting and laughing. So, just being thoughtful of where we sit that child and how we organise the environment.

Q: So, direct communication, face to face, removal of background noise, that's already going to do a lot without having to make major modifications to the classroom?

Devon: That's right, but also one of the things that really helps our child with Auditory Processing is amplifying the teacher's voice and we can do that in two ways, one we call a Personal FM System where the student wears a very tiny device in the student's ear and the teacher wears a microphone, so the teacher's voice is really going direct to the ear of our child with Auditory Processing. The limitations there is they're quite expensive and the teacher has to learn how to use that so that when she's speaking maybe to another child she has to make sure that her mike is turned off or that she's covered it up. Another way of improving what we call the 'signal to noise ratio' for our students is having the whole classroom amplified with a sound field system. There are various ones of those on the market today; some of them quite affordable where the teacher again wears a microphone and the sound amplifier is placed in a strategic position in the classroom where that sound is delivered equally to every child in the classroom.

Q: So like a public address system?

Devon: That's right, so whether the child is sitting in the front row or the back row they will equally receive the teacher's voice. Teachers also love these devices because they don't have to shout anymore and so it's very good for the teacher because the teacher will not end up with vocal strain from shouting at the children.

Q: Oh no, teachers shout at children; it doesn't happen that often does it?

Devon: Well, you'd be surprised.

Q: So are a lot of schools taking up these systems? If, say, for example a sound field system is going to be better for everybody, are people doing that?

Devon: Some schools are – I know in our area here several of both public and private schools have made their schools 'Auditory Processing Friendly' and so I think it is becoming more common and as new schools are being designed I think a lot of schools are bearing these issues in mind to help all students.

Q: **Devon, we have also talked briefly before about multiple intelligences, can we bring a little bit of that in when we're dealing with Auditory Processing Disorder strategies?**

Devon: Absolutely because I think if the teacher knows that – and every classroom is going to have at least one or two children in the classroom with either an Auditory Processing Disorder or a Language Processing Disorder, so if the teacher can use multisensory strategies as much as possible all of the students are going to benefit from that, not just our students with Auditory Processing. So we know these children have much more difficulty processing in background noise, retaining what they hear and processing instructions, so if the teacher can accompany verbal instructions with visual cues, such as diagrams, graphs, even written summaries, it really helps our student.

Q: **Or practical demonstrations perhaps?**

Devon: Absolutely. Hands-on teaching is very good. Many children we know learn best by doing than by listening, so the more practical strategies we can use, the better.

Chapter 4

Specific Remediation

In this chapter we look at specific remediation techniques used in the treatment of auditory processing disorder. In the final interview, Devon talks about the Fast ForWord program developed by Scientific Learning, and why is has been used successfully as treatment for auditory processing disorder.

Remediation Techniques

Q: **Devon, let's say that a child is going to have some specific remediation work done with Auditory Processing Disorder, what does that involve?**

Devon: Well following the assessment we would then delineate what are the major difficulties for each child because they won't necessarily be the same. So we know that one of the biggest problems for many children with Auditory Processing is the issue of difficulty hearing in background noise. So, in addition to maybe wearing an FM system, we now have a specific program to develop the skill of fine tuning one's perception in background noise.

Q: **This is about being able to zero in on particular sounds?**

Devon: And ignore the background noise.

Q: **Right, and that's a skill that can be developed?**

Devon: Yes, according to the developers of the 'LiSN' Program, that's L-i-S-N, you can specifically train that skill of tuning into a speech signal in the presence of background noise.

Q: **So who specifically developed the LiSN Program?**

Devon: The LISN Program came out of a PhD research of Dr Sharon Cameron at the National Acoustic Laboratory here in Chatswood in Sydney.

Q: **Here in Chatswood?**

Devon: Uh hum.

Q: Home grown?

Devon: Absolutely.

Q: Very good.

Devon: Down the road.

Q: So we're talking then, I guess, zeroing in on sounds being able to discriminate between the sounds that you then zero in on, as well?

Devon: Yes and we have other computer programs that have been specifically designed to do that, programs like the Fast ForWord Program and the Aerobics Program.

Q: They're computer based?

Devon: These are computer based, uh hum.

Q: Those particular programs are explicitly written for those particular problems or do they also address other things/

Devon: Well the Fast ForWord Program has, well there is a series of programs in Fast ForWord, they have a vast range of skills that they train including auditory processing skills, language skills and cognitive skills and reading skills.

Q: What about some more traditional methods? Are there practical exercises that students can do? Is it a little bit like going to the gym but just for your ears, so to speak?

Devon: Yes there are and if you can't access computer programs there are many strategies that can be employed to develop aspects of auditory processing depending on what the child's perceived difficulty is, or the child's assessed difficulty.

Q: Okay, so let's pretend that I'm in that situation and I've got a child who has Auditory Processing Disorder and I live remotely and getting access to speech/language services is difficult and I'm not very well serviced by internet services and don't have a lot of computers, there are still manual ways that I can deal with this problem?

Devon: I think if the auditory processing is impacting on the reading and spelling then very explicit teaching of sound letter association and sound sequencing is very beneficial. If the child has difficulty with a skill we call 'auditory closure' that's when we hear a signal but bits of it are missing and we've got to fill in those bits, we can actually train that with exercises, for example, we might do some sentence completion tasks, so we might say, 'Jack and Jill went up the...' the child has to say 'hill'. Little Miss Muffett sat on her tuffett. A different exercise is, we might say a word but omit some sounds and the child has to fill in those missing bits so we might say, 'What is this word?' and it might be 'te.e.cope' which is telescope or 'ho.i.tal' and they've got to tell you it's hospital. So what you're trying to do is the child is using their word knowledge and their context knowledge to fill in those missing bits so we can train that and there are various websites that you can access to download games of that nature and they're called 'Auditory Closure Exercises'.

Q: Okay, so there's some practical examples for Auditory Closure, just coming back to what you said before, how could a parent teach something like sound letter association?

Devon: Look, I think you do need some materials to assist you with that because when we want to teach sound letter association we want to teach it in its correct way. So when we're teaching that, for example, 'the letter M makes the sound mm', we don't want to say 'the letter M makes the sound mah' because 'mah' is actually two sounds. So I think guidelines from programs like Reading Eggs is a very good program, Phonics Alive is a very good program, and these are very easily accessed on the internet and I believe not very expensive at all. There are other programs, there's a program called 'Reading Doctor' which is very good, another program called 'Steps' which is very good and all these are quite affordable I think for most parents.

Q: The way a parent talks to their child we're suggesting is a very significant part of their literacy development?

Devon: Yes I think children need very good language models and parents who need to speak in a very clear way and keeping their language simple quite often helps these children. We know that Auditory Processing Disorders often impact on language development so another very simple skill that a parent can help a child develop is vocabulary. Vocabulary is really the core of language, knowing what words mean, the core of reading comprehension, the core of

writing, so if parents can encourage their children to learn new words so you can have a word of the day, 'Let's this week pick some new words we've never learnt before and learn those' and again there are many websites even for children and adults where you can learn a new word for the day to develop your vocabulary and they're free, so they're good. I think now with the internet we have access to many more materials than we ever have had in the past.

Q: And if I was actually able to get access to professional services, is it a once a week thing, do I have to go and see someone once a week with my child or is it more intensive than that?

Devon: Well it depends on affordability I guess. Some programs are only done intensively and I guess you get more 'bang for your buck' in that way in that we know that intensive instruction is much more effective in rewiring the brain so, if we can do a program for say, eight or 10 weeks on a daily basis, like the Fast ForWord program which is done 50 minutes a day, five days a week for eight to 12 weeks, it very much rewires the brain in those auditory processing areas and so we get very effective outcomes from a program like that. Or something like the Lindamood Bell Programs where children do go intensively, work one-on-one with an instructor. Again they're very effective programs because they're intensive, but not everybody can access – although the beauty of Fast ForWord is you can do it at home now on the computer so it can be accessed pretty much by anyone. But if you need speech pathology usually people attend once a week and they'd be given some sort of home exercises to reinforce that therapy.

Q: Something for the parents to work on with the children?

Devon: Yes, yes, yes.

Q: Devon, thanks for your time.

Devon: My pleasure.

The Fast ForWord Programs and Auditory Processing Disorder

Q: Devon, why does the Fast ForWord product work so well when dealing with Auditory Processing Disorder?

Devon: Well, the first consideration that we make when we're evaluating any – the efficacy of any program is, has it come out of research? And the Fast ForWord program came out of over 30 years of neuroscience before it was developed and since that time it's now been 14 years since the prototype of Fast ForWord was developed. It's had many innovations, many improvements, now there are 11 Fast ForWord programs encompassing a huge number of skills including intensive training for those children with Auditory Processing Disorder.

Q: So after that many years of research and now this many years of it actually being used, have we seen any results that are worth talking about?

Devon: There are over 200 studies been done into the Fast ForWord programs and with amazing results in some of those studies. Even the studies looking with neuro-imaging, looking at brains of students pre and post the program and seeing the actual physical changes we've made in brains to students with language and reading disorder, so we can actually measure brain change after the program.

Q: So after this many years of working with learning difficulties, why did you choose Fast ForWord over the other products?

Devon: Well, number one, because it has come out of many years of very well conducted neuroscience and two, because the Fast ForWord programs simultaneously develop so many skills so they develop all manner of language skills including, auditory discrimination, vocabulary building, grammar, syntax, morphology, every aspect of oral language and also written language now, reading and spelling, the sequencing skills, but in addition to that the Fast ForWord programs also intensively train cognitive skills so they're very much increasing the child's memory, attention, sequencing and processing, and there are very few programs, there are no other programs that I know of, that simultaneously incorporate all of those skills, the development of all of those skills.

Q: **So if a child has Auditory Processing Disorder the program is not specifically written for that but it can be used to treat that?**

Devon: Absolutely because the Fast ForWord program intensively trains aspects of auditory processing particularly auditory discrimination, auditory memory, following instructions, receptive language and those skills are intensively trained five days a week, for eight to 12 weeks and at the end of that time, we can actually now see that we've rewired the brains of those students in those areas. So, not only do they – has the research shown – that we can achieve physical changes in the brain, improved wiring of the brain, but also we can prove with post-testing that we've improved the function of the child so their oral language improves, their comprehension, their auditory processing improves and so there's lots of research to show that.

Q: **Devon, thanks for your time.**

Devon: My pleasure.