Web-Based Radio Show

Series on Learning Differences, Learning Challenges, and Learning Strengths:

A Review of Common Terms and Concepts

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Good morning. Welcome to our web-based radio show. Thank you for joining us today. We are going to continue our show with learning challenges. As you recall, last week we talked about a little girl named Sally and talked about her learning challenges. Just to review for those who weren't with us last week or who haven't had a chance to listen to it on the archived show, the main point we tried to emphasize in telling you about Sally was that when a child presents with a learning challenge – be it reading or math or oral or written expression or attentional problems or executive functioning or what's sometimes called "organizational problems" – that's often the tip of the iceberg. To understand learning challenges, we need to understand how the child takes in information from his experiences with the world, how he processes that information, and then how he plans and executes his actions – whether that's speech and language actions or motor actions or writing actions. So, we always have to understand the complete child, and that includes the child's emotions, as well as her cognitive and sensory motor capacities. Unless we understand all facets of the child, we're likely to miss that part of the iceberg that's beneath the surface, but clearly observable if you look carefully.

So, maybe to continue our metaphor of the iceberg, we now have the tools to dive underwater and look at the whole iceberg. Years ago maybe we could just see that tip of the iceberg and didn't know what was beneath the water, but now that we do we're obligated to work with the whole iceberg because, like the Titanic, if you don't see what's below the water you may have a catastrophe on your hands. While we're not anticipating catastrophes, we do want to have as healthy navigation as we can possibly have, and that requires seeing the whole iceberg.

We also used the metaphor last week of the learning tree, where the branches are the tip of the iceberg – the branches are the learning problems that you see or the learning challenges or the learning strengths, in some instances, such as a child who's a precocious reader, for example. The tree trunk represents the child's thinking capacities and the child's social and emotional capacities – their core fundamentals. The roots are the way children process information – their auditory processing and language, their visual-spatial processing, their motor planning and sequencing and their ability to modulate sensation – to take in sights and sounds. We talked about getting overloaded or over reactive or being under reactive or too sensory seeking. So, we need to be looking at the root system, the trunk, and the branches.

Before we go back to Sally and before we talk about how to strengthen all parts of our learning tree, I wanted to show you how this model of learning – where we look at all facets of a child's experience – explains many terms that many of you have heard when it comes to learning challenges or learning differences or even learning strengths. It's a confusing world out there – you'll hear terms like "non-verbal learning disabilities," "executive functioning problems," "organizational problems," "dyspraxia," "apraxia," "attention deficit disorder," "behavior discontrol syndrome," "sensory integration problems," and all of these terms relate often to attentional or learning challenges or differences of some type, but it's often not clear to parents and professionals exactly how one term relates to another term. Let me see if I can demystify this and also at the same clarify or shed light on some myths that are out there, and then we'll come back – and this will actually take us a number of sessions – and show how we can strengthen each part of this learning tree to help because, as we showed with the case of Sally, very few children just have one root or one branch involved. Usually there's a branch that draws your attention, but there are a number of roots involved and a number of elements in the tree trunk involved, so we need a comprehensive approach, usually. Yes, there are those rare children who just have one single branch and one single root involved, but that's the exception to the rule, rather than the rule.

So before we systematically return and talk about Sally and talk about how to strengthen and help children overcome and master their learning challenges with a comprehensive approach – which will take us a number of shows, actually, because we're going to go into great detail – I want to clarify these terms. I also want to anticipate where we're going with this and why this is so important for all children,

because many children with special needs also have learning challenges, particularly as they improve in some of their fundamental relationship and communication and thinking skills. It reveals some of the underlying processing problems and learning challenges or learning differences or learning strengths. And, in addition, there is a large number of children – probably, I would guess, close to half the population – that has learning challenges or learning differences and the other half has some type of learning strengths, which also require understanding if we're going to harness that child's true potential. So, all the more reason to take our time with this and go through it very systematically.

But, first, let's look at some of these terms that get confused. One is "attention deficit disorder." Children are being diagnosed more and more with attentional problems or attention deficit disorder. Now, there are two ways to think about attention. One is that it's a feature of the human nervous system and either you can pay attention or you can't pay attention and if you can't, you consider medication like Ritalin or Adderall or Concerta – one of the stimulants, etc. The other way to think about attention is that it's a learned process – that it has many components to it. When we see a baby in the first months of life looking and turning towards Mommy's voice or looking at Daddy's face and turning towards it and giving him a big smile, that's the beginning of attention. When a child at age 15 months is taking Mommy to the toy area and pointing to the toy she wants and motioning to get picked up so she can grab the toy off the shelf, that's not only attention, that's attention being used in a very functional, problem-solving way and it's a long, very active use of attention. When a child is sitting in the classroom and listening to the teacher and following her instructions and then raises his hand to ask for clarification, that's again a very active, dynamic problem-solving use of attention.

Now, of those three examples, one is just following an object, the other is using the motor system to solve a problem, and the last is using language and understanding ideas and communicating ideas – but they're all using attention. Now, the way I prefer to think about attention, and the way I think many of the professional colleagues who work with children with processing challenges think about attention, is as a dynamic, active process involving many parts of the nervous system at the same time. So, it involves taking in sights and sounds and touch; it involves processing information; it involves planning and executing actions. If you can take in information, process and comprehend it, and plan and execute actions, you can pretty well pay attention. We

know that there are many gifted people, for example, who are very active – they're on their feet, they're moving around all the time, they're fidgeting – and yet they are very successful professors or engineers or nuclear scientists or physicists or doctors or lawyers or wonderful parents or wonderful homemakers or creative chefs or wonderful plumbers or electricians – whatever one's avocation, occupation, or hobbies, we know that people who are successful at what they do and enjoy what they do can do it by being a little more on the passive side or by being more on the active side. What determines whether they're attentive or not and what I would call "functionally attentive," i.e., taking in their environment and mastering their environment, is how well they get all these different capacities I just mentioned to you – the ability to take in information, process it, and then plan actions – working smoothly together. When that's working a child is attentive, basically. In other words, he's an active problem solver, he's an active seeker, processor of information, and using that information to cope or deal with his world and his environment.

Now if you think about attention that way, it reflects something that I see all the time in my practice. When children come to see me with attentional problems or having been diagnosed with ADHD, nearly 100% of those children have what we call "motor planning and sequencing" problems. Almost all of them have difficulties with carrying out a many-step action plan in response to either a verbal request or visual information or an implicit demand of the environment, like solving an obstacle course. So, they have a hard time with the motor planning and sequencing. Other children – not all of them, but some of them – are over reactive to things like touch or sound, so they get overwhelmed and very easily distracted. Perhaps there's a child next to them at school in a busy environment that's making a noise and they get distracted by that sound or by another child's sound. So for some children, their over responsivity to sound leads them to be inattentive. Some children are over responsive to bright lights or sights; others to movement near them; others to colors. So, whether it's sights or sounds or just someone touching you lightly – light touch – or you get revved up by your own movement patterns and moving in space, the over responsive child is likely also to be a little bit inattentive.

Similarly, children who are under responsive – where sound doesn't register easily so you have to be loud and energetic to get their attention, or where even tickly touch hardly registers, so you have to give them a firm touch – don't respond very much to sound or to touch and they, too, are going to be inattentive because they won't know

you're there, they won't know you want their attention. There was a little boy in my office the other day and I was talking to him for a good five minutes while he was looking at his Game Boy and finally he looked up like, "Oh, so you're here!" and I was talking in a normal tone of voice. I let it go on for a while because I just wanted to see how much he could tune out and how under reactive he was, and I found during the session with him, as I increased the energy in my voice, I could get his attention within a second every time, but if I talked to him in a normal tone of voice, he was basically tuning me out and just in his own world. He was very under reactive, it turned out when we went through his history very carefully, and he was under reactive in a number of modalities.

The sensory seeking child is a child who may be under reactive or may not be, but he seeks out a lot of sensation. So he's constantly looking for more touch, more sight, more sound, more movement, so he's going to look very distractible, very inattentive, and also going to look very active – he's your typical child who gets diagnosed with ADHD.

Now, for the child who has these modulation problems (or who doesn't have them but can't decode or process verbal information) if you say, "I need you to go upstairs, get your shoes, come back down, put them on, and get ready to go outside because we're going out to lunch," he may only be able to process the first part of that sequence – "I need you to go upstairs" – and then he forgets whether he's supposed to get his shoes or not or come back down. Now, his problem is in sequencing information, holding on to complex verbal instructions. He's going to also look very inattentive because, literally, on the way to the bathroom he gets so distracted by a toy that he forgets why he's upstairs or that he went up in the first place to get his shoes.

The child who has visual-spatial processing problems – who can't see the big picture – that child needs to go upstairs and find his shoes but doesn't know where to look systematically because he doesn't have a picture of the room. So, he goes and looks near the bed, doesn't see them, and then gets distracted onto a toy because he doesn't have a systematic understanding of the environment where he is able to construct a map and he says, "Let's see, it could be under the bed, in the closet; maybe I left it in my brother's room," etc. Well, that visual roadmap would give you the guidelines to be a systematic searcher in order to maintain your attention. Just think of it this way: You're in a forest and you only see a couple trees. You're going to go from this tree to that tree and you look very inattentive. On the other hand, if you're in a

forest and you understand how the whole forest is working, where all the roads lead, you're going to look like a good problem-solver, very focused, very attentive, systematically trying this road, then that road, then that road until you work your way out of the maze, which is the forest, and find the main highway. So your visual-spatial processing – your ability to see the big picture, to understand yourself in space – is also going to affect your attention.

Similarly, your ability to decode other sensations and put them all together – getting your whole mental team working together – your body in space, the left and right sides of your body, your balance and your coordination, as well as modulating sensation and planning actions and comprehending what you take in through sight and sound and touch – all of that and how it works together is going to affect your attention because when they work all together as one good team it's like a wonderful ballet or a wonderful basketball team – you're an active problem-solver, using all your senses, using your motor skills, using your language and your visual-spatial understanding of the world, and you're a very effective problem-solver, you're very fortunate. But if your team doesn't work well together, you again appear to the world and to yourself that you're living in a more piecemeal world – you see something, you make sense of it, but then it doesn't match up with what you hear or it doesn't match up with what you want to do and you're torn in three or four different directions at the same time. So, we've got to get all these pieces, all the parts, working together.

So we see here a simple issue like attention and a child being diagnosed with ADD or ADHD may not be simple at all. Again, the attentional problem may be the tip of the iceberg, but underneath the iceberg are the root system and the trunk system that we reviewed last time and that I just reviewed earlier today. So, we want to redefine attention and ADD and ADHD in terms of our learning tree and in terms of what's contributing to the branch. So, we want to think of attention as a branch, and even the diagnosis of Attention Deficit Disorder as a branch, and figure out how these things work and how it is that the child is having attentional problems – in other words, how does his whole learning tree work?

You've also heard the term "cognitive deficits" or mental retardation. Cognitive deficits are often the full range, from just very, very mild ones that wouldn't constitute mental retardation, to mildly mentally retarded or borderline mentally retarded or low IQ or borderline low IQ, and basically these are often determined by an IQ score. So a child who gets around 100 on his IQ is considered average, 110 is high average, 120 is

getting into the superior range, and then into the very superior range when you get up to 130 and above. On the other hand, if you drift down to 90 you're in the low average range; you drift down to 80 you get into the gray area of very low average to mild to severe cognitive deficits; and then you get into different levels of "mental retardation" if you're going to use that characterization. But, again, as we look at cognitive deficits and mental retardation and look at our learning tree, it's not so simple. What is an IQ test? An IQ test is simply a series of learning tasks, some involving the visual system, some involving language, some involving motor planning and sequencing, some involving the speed of the motor system, so all the elements I mentioned for attention and all the elements of our learning tree are tapped by different aspects of an IQ test. But the IQ test is not the best assessment of each of these aspects. For example, the IQ test has some motor tasks and has some speed motor tasks, but it's not the ideal way of looking at motor planning and sequencing. These tasks that are on the IQ test are there more for historical reasons because they were done years ago and there's a lot of data on many children, there are a lot of norms. But just because there are norms and data doesn't mean it's the best indicator of motor skills. Similarly, there's some language and auditory processing and vocabulary items. Again, they're not the best ones to tap language skills, but they're there for historical reasons.

So, we have on our IQ test a kind of conglomeration of a series of isolated skills tapping different cognitive capacities that are really a hodge-podge and they don't tell you anything more than how the child does on that particular test or that particular skill-based item. So it's useful if you have that information and you can sometimes infer, saying, "Well, this child, for example, was very good at sequencing the pictures that show social reasoning, but was not very good at object assembly, putting together this physical object that's sort of like putting together a little bit of a puzzle, but he was very good on vocabulary." So you could say, "Well, gee, he seems to have a good memory; he isn't very good at spatial problem-solving; and he's a little stronger at social skills – sequencing pictures that seem to tell a story – but you're inferring an awful lot from that one little test. Again, if we want to get at social skills, we're better off finding out how he's doing at school with friends and how well his judgment is in complex social situations. If we want to get at motor skills and spatial problem-solving, we want to do 10 or 15 items in that area, not just one or two. If we want to get at memory, we can test that than just with a vocabulary test. So, here, too, we can infer things – we can make some sense from the IQ test and it helps compare a child to other children – but it's not the best way of doing it. The conclusions that are drawn from it – when the

child's verbal scores cluster around 90, the child's performance scores, which is motor and spatial, cluster around 80, again it tells you a little bit – that he's a little stronger in one area than another, but it doesn't give you as definitive a profile as we'd like to see. So, we have to take it with a grain of salt.

Now, again, here you're much better off going into each aspect of the root system – going into the capacities we described last week as the trunk – and then looking at how the child performs in the branches and getting to know that child over time in the actual problem-solving real world, but we have to break it down in terms of our roots, our trunk, and our branches, and then see how that child is actually learning.

Now in terms of cognitive deficits and mental retardation, the other important point to mention – so we don't all get confused by these terms – is that cognition and mental functioning is a dynamic, growing process. Because a child is behind now doesn't mean he'll be behind tomorrow or five years from now. What we have to do is look at the learning curve over time, not at the child at any one point in time. For example, if you have a child who hasn't been given an opportunity to master certain experiences, there's no reason for him to show competency in that area. On the other hand, if you get him in a rich environment that works with him properly in that area, we may see a nice learning curve. So, the rule of thumb is I refuse to make a diagnosis of a cognitive deficit, which sounds permanent, or mental retardation, which sounds permanent, until I've had a chance to orchestrate a program for at least two years with a child that is as close to an ideal program as we can organize for that child and is using the best current knowledge available to mobilize that child's learning and growth and development. Then we watch the learning curve. As long as that learning curve is sloping upward, we don't want to talk about a cognitive deficit, other than in the temporary sense, and certainly not mental retardation, which implies something permanent. If the child has "ceilinged out" and shows no progress in an optimal program with optimal support at home for that program and optimal work at home for two to three years, at that point, we might think of the delay as more chronic. Or if the child has a progressive neurological disorder where he's actually losing capacities rather than gaining and nothing available in current medical knowledge or in current educational approaches seems to be able to reverse that trend, then we can also talk about a more chronic process. But, other than those two situations, we want to create the opportunity to learn and master and watch the learning curve, and we need a dynamic process over time in order to make an appropriate designation.

Another term that gets used a lot in learning is "intelligence," itself, and, again, as we were saying, the way in which intelligence, itself, usually gets discussed is in terms of IQ test scores although, occasionally, somebody has the competence to say, "Oh, I think this is a highly intelligent child" just by talking to him or just by the way he learns. I won't repeat that because we covered that when we talked about cognitive deficits and mental retardation, but the judgment of intelligence should not rely on an IQ test because an IQ test is a poor measure of one's intellectual functioning. It is simply a hodge-podge of different items that have historical value and, sure, if you take 5000 children and look at kids who score over 140 and children who score under 80, you'll get differences. But you don't need an "intelligence test" to do that; you can just observe the child for five minutes while he's trying to solve a problem – anything, from finding his shoes upstairs to describing what he wants for breakfast – and know the difference between a very, very high-functioning child and a child who's struggling to master the fundamentals.

In terms of understanding the differences between a child who scores 115 and 125 on an IQ test or 125 and 135 or 140, now we're getting into fine-tuned territory that people make a lot of – one child is average or high average, the other child is superior – yet, when you get into that narrow a range, that's where the intelligence tests, all of them, fall down, again, because they're only a hodge-podge of different skill areas. Here, functional intelligence can be measured but it needs to be measured in terms of our learning tree and the way to define intelligence in our learning tree is by looking at our tree trunk: What is the level of the child's thinking skills and the social and emotional capacities that go along with and support the thinking skills? That provides us a framework for thinking about intelligence in a new way. We've written about this in our book, *The First Idea,* and have a whole chapter on it, but it's basically the level of capacity for reflective thinking and problem-solving that uses all the senses, that can carry out high-level problem solving or reflective thinking across a full range of human endeavors, including all the emotional themes of life, using all the different processing areas in a variety of both academic and non-academic problem-solving settings.

Now, another term that gets used quite a bit is the term "executive functioning." Executive functioning usually refers to the ability to plan and sequence actions and problem-solve. It's very close to what we call motor planning and sequencing as we expand it to the world of ideas – sequencing and problem-solving with ideas. A good functional way of thinking about executive functioning is that it's the child's ability to

take in information through sight, through sound, through an implicit challenge in the environment that he sees through touch or through his own motor activities through experimentation, and to process that information and plan a sequence of actions that solve a problem. The emphasis in executive functioning is on the last part – the planning and sequencing of the action pattern or the verbal strategy, but it depends on the first two steps, as well, so it's more complicated than just the action plan. So, executive functioning focuses on the ability to execute a complex, problem-solving action plan and carry it through, but it requires our whole root and trunk system to do it because you have to take in the information in order to respond to the information, and you have to comprehend it in order to respond, and then you need an organized plan of response. So that would take the mystery out of executive functioning, which really involves our whole root and trunk system of our tree, and any part of it will affect what we call executive functioning.

Now another term that gets used quite a bit is the term "nonverbal learning disability" and this term often refers to children who have problems in learning that are more related to the nonverbal system than the verbal system. Here, the problem often has to do with issues that don't require verbal reasoning or auditory processing and comprehension of words and sounds. So, it's usually less related to reading, less related to following verbal instructions, less related to language and dialog or oral presentations, and more related to things like doing math, solving mazes, carrying out complex motor actions in a rapid way, using maps, using graphs, and having a sense of one's environment. Sometimes social reasoning will be affected because it involves understanding how things work in space and understanding quantity concepts that are important for math. Those are all things that are often affected.

It is thought that nonverbal learning disabilities have to do more with the right side of the brain, which has to do with spatial and motor planning capacities and some of the emotional and affective capacities, whereas the verbal learning challenges have to do more with the left side of the brain, having to do with language, including reading. These overly simplified partitions, such as the right side of the brain versus the left side of the brain, are just that – they're slightly overly simplified – and the term "nonverbal learning disability," again, is too global a term and oversimplifies the complex issues because children who are given that term, for example, often have a variety of strengths and weaknesses in the areas that are nonverbal, but it's

not across the board. So, for example, a child may be very, very strong in visual memory – you show him a series of cards and he'll remember the pictures and the words written under the pictures very readily – but if you ask him to go on a treasure hunt and find something and you provide visual cues, he can't see the forest for the trees and is not a very good problem-solver. Or if you ask him to draw or describe how a house would look through a mirror image or you give him a block design and tell him to flip it to a 90 degree angle and ask him what it would look like when it's flipped, he can't do it. There's a whole series of tasks that Harry Wachs designed on visual-spatial thinking and processing that children can be very uneven on. They may be able to do some of them and not others.

So when we get into the whole nonverbal area, like visual-spatial processing and reasoning, we see that each child has his own unique profile. Some children have more problems in the motor area but may be very good with, say, abstract visual problem solving, so we have many physicists who can really visualize space and see complex relationships but are very clumsy and weak on their motor side and very weak on their motor planning and sequencing – the absent-minded professor – and it's not due to language problems, it's due to another aspect of the nonverbal area – the planning and sequencing – even though their ability to comprehend space and comprehend abstract concepts in space is very, very strong. We have people who confuse the left and right sides of their body, again, but are very good abstract mathematicians.

So, the point I'm making here is that each aspect of our root system needs to be assessed and we shouldn't try to summarize it in terms of a broad term like "nonverbal learning disability" or even broadly saying, "Well, the verbal is stronger and the nonverbal is weaker," or vice versa because it's too broad, too global – there are too many capacities involved there. We have to take each one apart – visual memory, visual thinking, and motor planning and sequencing. Each root has to be assessed independently and every child will have his own profile.

In a similar way, we often use the term "verbal learning disability" for a child who has trouble with language or who has trouble with decoding sounds and reading or reading comprehension. Again, we need to break that down. What are we really talking about? The summary term may obscure, rather than clarify. There's a child who has a hard time with distinguishing sounds, but once he gets the sound in the word he has good comprehension of it. Or is it a child who can understand the

sounds and say it back to you because he has a good musical ear – a good ear – but who doesn't comprehend what the word means. Sometimes "central auditory processing disorder" is used for children who have problems higher up in the pathway in the comprehension of the words, in the sequencing of the words together into patterns and understanding what that pattern means. That, too, is often vaguely used before we understand it. I've had children who are thought to have central auditory processing disorder, where they don't understand language, and then I get them talking about something that's very emotionally meaningful to them and all of the sudden their understanding goes up 300%. So one child, for example, comes to mind who supposedly had a weak understanding of language and didn't understand words like "competition" and "rivalry" or a complex concept like, "Gee, I understand that Huck Finn and Tom Sawyer were both rivalrous with their parents but in different ways. How would you characterize that?" He couldn't do that so he was thought to have problems with higher-levels of comprehension. When I said to that child, "Do you understand what the word 'rivalry' means or 'competition' means?" he shook his head "no." When I said, "Well, you have a brother at home. What happens when you both want to play with the Game Boy at the same time?" So he described the battle, how they'd argue and fight. I said, "Well, who wins?" He said, "Well, I do because I'm bigger and stronger." I said, "Well, you're 'competing' for the Game Boy. That's called 'competition' and you win because you're bigger and stronger and you get it away from him. He said, "Oh, that's competition!" I said, "Now, can you think of an example where you might compete with your parent?" He said, "Yeah, when I want to watch a certain TV show and my dad wants to watch another, I yell and throw a fit until I get my way." I said, "Who's winning the competition?" He said, "I am." I said, "Well, now, in that story with Huck Finn and the little segment when he's talking to his parent, what's happening with competition?" He said, "Well, Huck Finn outsmarts his father because he sneaks around and goes off with his friend, even though his father tells him not to, so he actually wins the competition." I said, "Very true, very good." All of the sudden, in a few minutes, he had an understanding of the concept of competition. Now, we did it because we created a high-affect, high-emotional situation that was personally relevant to him, i.e., his brother, and from there we went into the more abstract material about Huck Finn and his father, and it turned out that he had no trouble sequencing and understanding the concept. It hadn't been taught to him properly in that sequence. Some children require that, some

don't. Some can relate it to their personal experiences on their own. Some need the educator or the parent to do that for them. Now, when you need it to be done for you, it's not because you necessarily have a fundamental deficit, it may be because of your lack of exposure to that concept or to those words at home in emotionally relevant situations. In other words, everyone learns these words, "competition," "rivalry," and other abstract terms in emotionally relevant situations having to do with meaningful experiences, but where that language and those words have not been used in that context, there's nothing to generalize from, so when you read about it in a book and someone asks you to use it, we then have to create it for those children. For the children who already have it, it's not that they were born with it. They've just had that in their environment and they've already had the understanding of the term so they can now apply it to something more general.

This doesn't mean some children don't have problems with sequencing verbal information but, again, we should take the mystery out of the term and rather than use a term like "central auditory processing disorder," which sounds very confusing, we should talk about what exactly is the child's difficulty. Is it in understanding certain words and concepts and, if so, what's the reason? Is it that they haven't been exposed to it? Is it because no one's tried to use a personal, emotionally meaningful example for them where they actually do it? Is it because they can't sequence many words in a row and see a pattern? They only understand two or three words, not five or six words in a row? What is the challenge the child is having? So, let's talk about it in very practical, functional terms. We have to, in other words, break it down and understand how it's really working.

Now there are other terms that get used also having to do with memory. A lot of children are thought to have memory difficulties. There are terms like "working memory," "declarative memory," "recent memory," "long-term memory" and these, too, can get confusing. "Working memory" usually refers to memory that we're using to solve a problem in the here and now. In other words, it usually requires what we're recruiting to figure out how to play this particular computer game or how to get our lunch. So, a student takes elements from recent memory or may take elements from history – things we've done before – that are part of habits, and puts them in a very operational, current context to solve the problem. So, it's pretty self-evident – it's working on something that's present and very current – working on our work. Children who are thought to have problems with their working memory often have trouble synthesizing the different parts of their root system with their trunk

system. So what appears to be a working memory problem may, in fact, be a problem with over reacting to sensation, which affects your ability to attend to the task at hand and disrupts you from solving that problem, which makes you look like you don't have a good working memory. Or it may be not understanding the visual pattern you're dealing with, or it may be not planning or sequencing the actions. What appears to be, "I can't remember how to do this" may, in fact, be confusion. Anxiety can disrupt that, as well. So, again, we have to break it down. What is actually involved in the child's solving the current task? But, again, we want to take the mystery out of the term "working memory."

Now "recent memory" refers to items like things that have happened in the last day or two or last few hours and can be something the child will forget, like what he had for breakfast. Obviously individuals – such as elderly individuals who are having some memory loss because they're in the early stages of Alzheimer's or due to central nervous dysfunctions secondary to cerebral vascular disease where there's a narrowing of the vessels so there's less oxygen going to the cells of the brain, will have memory loss, particularly for recent memory, and that will also certainly affect working memory, too. But those are unusual and it's unusual to see those in children, other than in children who have some kind of a metabolic or progressive neurological disorder.

So it's certainly something we want to pay attention to – in terms of things they can't remember – but for children, especially, it's important to look at the contributing roots and whether it's affecting their working memory or their recent memory. The child may not pay attention while he's eating breakfast. He may be thinking about something else and therefore he can't tell you. He may not understand the question. He may be being negative or he may not be able to sequence auditory information and he may not be able to tell you what he had for breakfast because it requires creating a sequence of words in a logical order. He may have trouble picturing what he had and it may be more of a visual-spatial problem that he's having. Or he may be distracted onto something else while you're talking to him. Or he may simply not be interested. So, again, we have to break it down and we have to understand what we're talking about.

Another term that gets used quite a bit is "sensory integration" and sensory integration is a whole field developed by the occupational therapist Jean Ayers, who was the pioneer. Jean Ayers, way back in the 1960's, developed a very elaborate

theory on how children differ in the way they react to sensations. She's the one who, along with some psychologists at the time – Sybil Escalon and Lois Murphy – as far I know first described the over reactivity or under reactivity to sensation that we see in children. She also talked about motor planning and sequencing, which is also called "praxis" and problems with it are called "dyspraxia" or sometimes "apraxia," but she also came up with an organizing theory having to do with the vestibular system – the importance of the vestibular system – in organizing all of this. Now, what I want to emphasize here is her clinical observations hold up today and they're the cornerstone of what many occupational therapists do in their daily work and they're a very valuable contribution to understanding learning. The meta theory – the overall theory – of the importance of the vestibular system has not yet been definitely proven as an organizing theory, although many elements of it seem quite relevant, but there are many colleagues who have literally thrown out the baby with the bath water – not from occupational therapy, but from other disciplines – who haven't paid enough attention to Jean Ayers' work and the work of occupational therapists because they don't agree with aspects of the organizing theory that puts so much weight on the vestibular system and therefore haven't taken advantage of the clinical insights that are so very, very valuable.

But sensory integration approaches are approaches that work with the sensory modulation differences and the motor planning and sequencing differences. They don't get into as much the auditory processing or visual-spatial processing, other than the modulation part, but they do get into the processing of touch and movement quite a bit. So, sensory integration covers many elements of our root system. It doesn't cover our trunk system, but is important in terms of shedding light on our roots and our branches. I prefer to think of it in terms of, again, what it contributes to our understanding of the different roots. So, I like to use the insights of sensory integration theorists and clinicians to better understand the roots, but often seek consultation from my occupational therapy colleagues, but it's a term that talks very much about the root system very much like we're talking about it here. It doesn't cover it quite in the way we're presenting it in this book but it comes close, and you'll readily see how it sheds light on many aspects of the roots.

Now, just a moment ago we talked about memory and I wanted to just further clarify a few terms that I didn't clarify. We get terms like "declarative memory" the formal definition of declarative memory is "episodic memory" and what's sometimes called "semantic memory." For the most part declarative memory is our

conscious memory – what we remember consciously. Episodic memory is tied to specific moments in one's life things that we've experienced personally, as opposed to knowledge or facts that we've learned. There is a storage area for non-conscious memories and that consists of two parts – often what's called "procedural memory" or "associative" or implicit memory. These might be skills we've learned that are just part of our make-up, so to speak, like when a 16-month old learns to solve problems he's doing that kind of implicitly or procedurally. It may not be part of conscious experience that we can describe later on; we just kind of know how to do it. These terms are only important and I'm only mentioning them here because you'll hear them in the learning literature and so when you hear about "conscious memory" and "implicit memory" and "unconscious memory" and "associative learning" and "logical learning," these are all part of that system and just to review it again, declarative memory is our conscious memory – it has both things we've experienced, as well as things we've memorized from dictionaries or books. The non-declarative memory includes things that are less conscious that can be implicit, things we've learned but that are just part of our make-up. Sometimes we learn them very, very young. It could be things that are out of our consciousness but we have them associatively, so when we think we bring them into consciousness as part of our associative memory. Our psychodynamic and psychoanalytic colleagues, myself included, would think of the associative memory as very important because it gives us access to unconscious or non-conscious procedural memory or implicit memory; however, often we have to infer by things we do because we often don't happen to tap into that through our associations.

Now, I'm sure there are other terms that you've heard when it comes to different aspects of learning and different challenges that children have, but these cover a large number of them and the other terms, obviously, that you've heard have to do with specific learning disabilities – reading problems, math problems, oral and written communication problems, that we talked about last week, so those are our branches on the tree trunk.

Now we're almost out of time so let me just talk a little bit about next week's show. This week we talked about the terms that get used in the learning literature, in the whole learning challenges, learning disabilities, learning strengths literature, that are better explained by our image or our metaphor of a learning tree, by our roots, our tree trunk, and our branches. So, again, the root system has to do with how we take in and process information and plan actions; the tree trunk has to do with our

fundamental thinking and social and emotional capacities; and the branches have to do with the actual reading, math, oral and written expression, attentional and executive functioning and memory capacities that may be implicated in different learning challenges, or learning differences or learning strengths. What we're saying both last week and this week – last week in the case of Sally and this week with this review of commonly used concepts – is that an individual child like Sally and any of these terms that are used are best understood in terms of our model of the whole entire learning tree.

Next week we're going to start a series of sessions talking about "How to Strengthen Children's Learning Capacities" so next week it'll be *How to Strengthen Children's Learning Capacities, Number I*. It will take us a number of sessions to go through this, but I think you'll find it very, very helpful because we'll be able to get into the practical exercises, of which we gave you a little glimmer today when we talked about the example of using the child's emotions and emotionally relevant information, and then extending from that to help him generalize.

Okay, well, thank you for joining us and I'll speak to you again next week. Bye bye.