

Web-Based Radio Show

Learning Disabilities, Learning Challenges, Learning Differences, and Learning Strengths

Visual Spatial Thinking


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Good morning. This is Dr. Greenspan. Welcome to our web-based radio show. Today we're continuing our series on learning challenges, learning differences, and learning strengths. As you recall, we're using the metaphor or image of a learning tree, with a root system, which has to do with the basic processing abilities; the tree trunk, which has to do with our basic thinking and social capacities; and the branches, which have to do with specific academic skills. We finally got to the branches last week and we talked about reading and reading comprehension. I have just a few additional thoughts about reading and then today we're going into oral and written expression and, if we're fortunate, math and aspects of executive functioning that relate to specific academic capacities. We may even be able to complete this series today; if not, we'll complete it next time.

When we talked about reading and reading comprehension last time, as you recall, we talked about the two parts of reading: one, being able to recognize the words and make sense of them and, two, being able to comprehend what you read and to comprehend it at different levels. Your ultimate comprehension is going to be determined by your thinking ability because once you can "upload the information," so to speak, it's how you put it together in your mind that determines what you think about it and what you comprehend. So there's a difference between just memorizing some facts from a passage and comprehending the author's main message or comparing it to other authors' messages or comparing it to your own thoughts about that subject, and so forth. So the better your thinking and the better your reflective skills, the deeper and more thorough and more analytical your comprehension will be.


In the uptake part we talked about some kids having good visual memories and just recognizing whole words, but it's always helpful to sound out the words – that makes



for good spellers and good readers, even for new concepts and new words. We talked about phonemic awareness and the different ways of making the letter-sound combinations meaningful to you and masterable for everyone. There are a few elements that I'm not sure we've touched on and if I'm repeating these, they're worth repeating. Some kids – a smaller group of kids – in addition to, or rather than, having problems with identifying the sound-letter connection, have difficulty and just get overloaded by what's on a page. They're very sensory over reactive and the black on white may overload them; or seeing so many words just makes everything a clutter. Researchers at MIT found that when you use filtered paper over the page – like a blue filter or a gray filter – it softens the background vs. foreground – the lettering vs. the white – and makes it easier for some kids to read. You have to experiment with different things – some kids need to brighten up a little bit and, there, yellows may do better, but you can get a see-through plastic filter paper and experiment with that.

Also, some kids do better when you isolate the words or phrases or sentences, so you take a cardboard box and you cut out a little rectangle and you experiment with different sizes and you see what happens when you just focus on the word or phrase or sentence that the child is focusing on, and then you can slowly expand that. So, it can be starting with the phrase or just a word or two, and then you go to a whole sentence, and then to three or four sentences, and then a whole paragraph; so pretty soon you're moving this rectangle down the page with you until you can actually look at the whole page. Doing this, for part of the time while you're reading, helps you focus in and helps you track if you're easily overloaded by all the print coming at you. So those are worth noting and this is part of taking an approach to reading that's multi-sensory in orientation and that recognizes individual differences in sensory reactivity, in sensory processing, and in the way we plan our actions.

Now other children have trouble just keeping track of the line and will skip lines and get lost on the page because of visual tracking problems or visual motor problems and, there, having a ruler or something that guides you down the page, or using the cut-out rectangles from a big piece of cardboard, can help keep you on the line or on the paragraph that you're in. Again, this is something that teachers and parents and students need to experiment with in order to find the best ways for them. But you don't experiment with these things unless you recognize there are individual differences and that for a child who's having trouble, it may not be for the obvious reasons. Always check out how easy it is for the child, number one, to make the connection between the sound and the letter or the word and whether he needs more basic work on that, which we talked about last time; number two, how well does he actually perceive the letters and




combinations of letters he needs to perceive in terms of being over or under reactive, and will the filter paper work or will the rectangle in the cardboard work, or does he have trouble tracking across the page and staying on the line? There, too, a pencil in the margin or a ruler or an open rectangle in a piece of cardboard will help. Or does he have trouble with comprehending beyond the facts? Or does he have problems with just the facts, which might be more of a memory challenge? Or does he have an attentional problem? Or does he have difficulty beyond the facts in making sense of what he reads, in which case it comes down to improving the fundamental thinking level, i.e., the tree trunk that we talked about.

Now, what I want to do is move on to a close cousin of reading and reading comprehension, which is oral and written expression. When we look at oral and written expression, we're looking at different elements. For oral expression, we're talking about the ability, first, to articulate sounds in terms of oral-motor skills. This comes back to the basic root system where we talked about language. So oral expression and language are really one and the same. You have to be able to articulate, so you may need oral-motor work, and then you have to have, first, the gestures that allow you to articulate; then movement, and gesture, facial expression, pointing, showing what your intent is and what you want to communicate in words, then in phrases and whole sentences and whole paragraphs. So that's one part of it that we've talked about.


The second part of oral expression is making sense. There are two aspects to oral expression. One has to do with a range of ideas that one has – the associative range – and one's creativity, and the other has to do with keeping things in an orderly sequence that makes sense, and this has to do with our basic thinking ability. Somehow children who are good thinkers and can argue why they want to go outside or why they need a new toy or why they're being treated unfairly in comparison to their brother or sister, when you ask them to explain something they just read or talk about something at school, they just wander all over the place. So, here it's important to recognize that the child's basic ability for thinking needs to be employed in his oral expression. But, first, the child needs to be aware of that – that that is an important foundation, that that is an important goal and that the two are the same, so when they're talking about something at school, it's no different than arguing why they're desiring an extra ice cream cone.

Let's go back to the first part: the range of ideas. Some colleagues – certainly language and speech pathologists – talk about children who have word retrieval problems, who can't find the word to describe what they want and who don't seem to have that associative range of a large vocabulary or large concepts. In order to strengthen this ability, the key thing is to provide – remember our two principles for academics that



we talked about last time – multi-sensory and emotionally meaningful opportunities for practice. So lots of kids simply need more experience in the world. In other words, don't try to build up vocabulary by memorizing dictionary words and don't try to do it by just looking at pictures in books, although books and pictures can be helpful. Get involved in the real world – go on nature walks, go to the zoo, take a bus ride, go to the supermarket, go to the playground, walk around the block. In doing these things, play a little game of, “Let's see how many things we can recognize; let's see what we see.” What do we see, what do we hear, what do we smell, what do we touch? So, whether you're in the supermarket or looking at flowers or going to the zoo or on a bus, what can we smell, touch, see, and hear? In other words, help a child pay attention to all his sensory input and describe it. You can make a little game out of it by seeing who can describe more things. As you do that, the child is becoming more aware of his world. And what do you know? As the child is becoming more aware of his world, he is developing the vocabulary to describe that world and that's increasing his associative range.


Also, imaginative play is wonderful for that because the toy soldiers or the ballerinas can be going to the moon or going to Mars or pretending to copy a TV show, or they can be on a nature walk or taking care of a little baby, doing things that the children observe. So, once you experience the world, you then have a rich array of experiences to play out in new ways in your make-believe play, so you can combine going to the market with building a rocket ship, and on your rocket ship you may want to have a supermarket because you want all the “goodies” on your trip to Mars that you're going to need, and so forth and so on. So increase that associative range. Children in families that chitchat about everything and that involve them in lots of experiences generally have a bigger associative range. Now some kids just naturally have a bigger associative range, but where that's not happening, increase the experiences; where it is happening, still increase the experiences – it'll be even better. So provide lots of experiences that provide that substrate for oral expression – the range of ideas. In providing those experiences, make sure you're not overloading the child. In other words, don't run around from the bus to the supermarket to the swimming pool to the zoo because you want to fill a child's day up – but do it in a calm, regulated way that's fun, because the key thing is that for the child to use the words and to fully understand the experience he's in, he has to enjoy it. So start out with experiences the child wants to do. “What do you want to do today? Go the market? Go to the playground? Go to the zoo or the petting zoo? What books shall we look at?” So make it something the child is fascinated with and interested in, but if the child is only interested in one or two things, slowly expand his range. The way you expand it is, you take the things he's interested in and join it with things he needs to expand to. So let's say you have a child who loves



chocolate chip cookies and therefore likes to go to the supermarket. Well, today, they have a special chocolate chip cookie at the zoo! You, obviously, have it in your own backpack and when you get to the Panda House, but what do we discover but the chocolate chip cookie's at the Panda House and the panda's going to give it to little Johnny or Susie! That way we get him interested in pandas or vice versa. We might have a picture of a panda in the supermarket, etc. So, let's expand that range.

Now, the second part of oral expression is making sense. Here we come back to our tree trunk. The different levels of the tree trunk, which I won't review for you, involve different thinking levels. Once we get to connecting ideas and the basic "why" level, we then get into gray-area thinking, comparative thinking, and finally reflective thinking, where you can evaluate your own thoughts and feelings. As you're expressing something to help your child be a better oral expresser, always come back to this: Is the child making sense? Is the child progressing to comparative thinking and gray-area thinking in accordance with his age – by ages 6 to 9? Is he getting reflective between the ages of 9 and 12 where he can evaluate himself and reflect on things and make higher-level comparisons between his own views and other people's views?

Now, in promoting that – oral expression and making sense and being logical – in other words, being a good debater – again, start with things that are emotionally meaningful for the child. So the model is, if you're presenting it in class, don't present "What I did this weekend," where you just string together a series of random events that have no intrinsic logic to them, "I did this, I did that," or "What did you do at school today?" but ask questions more like, "Well, what was the most fun that you did this weekend? Did you do anything exciting and why was it exciting?" or "What did you enjoy at school today? What was the best and the worst and why was A the best and B the worst?" Now, there, you're asking the child to talk about something emotional – it's just like asking a child to talk about why he deserves that extra toy or that extra ice cream or why he's better than his sibling at something. Inherently, when a child is arguing about something that's emotionally meaningful, they often argue it logically. You'll find that all the time. The reason is that the emotions organize your thoughts for you. In other words, if you're just thinking without any emotional investment, your thoughts will be random and associative. Even as adults we do it ourselves. Picture a particular emotionally invested subject where you're asking your boss for a raise and giving him the reasons or you're mad at your spouse and telling him all the bad things he's done. Inherently, you'll find that you're creating a logical argument. So, start off with things that are emotionally meaningful for the child and then help him see how good his argument was. Then you can actually diagram what he told you. "Well, let me see: You're telling me that the most




exciting thing at school today was this?” Make a big box. “And when you were doing this, you did the following activities. So playing on the playground was the most exciting thing today and on the playground you played some soccer and then did the swings and then bounced the basketball and then you played chase with your friends. Okay, well look at this! We’ve got the main point and the examples. Wow! That’s a good description.” Then the child sees what thinking is all about and this can be done at different levels, from just basic “why” level answers to multi-causal thinking, where you give many reasons for something – why it was an exciting day; to comparative reasons why today was better than yesterday at school – “Because we got to play more on the playground and got to do the following activities”; to gray-area thinking – how much better was today than yesterday? “Oh, it was a lot better because I really love going on the swings and we don’t get to go on the swings every day and that’s my favorite, favorite activity!” “By how much?” “Oh, on a 10-point scale, a 9 out of 10.” So now you’re getting into gray-area thinking and the child is finding the reasons why today is a great day.

Then you get to the reflective level, something as simple as, “Why was today a great day?” “Because I got to go on the playground and you know that I love playgrounds more than most people do – I’m a playground kid! I don’t like being in the classroom.” So, now, you’re reflecting on yourself and you have a sense of yourself as a person – as a person who doesn’t like classrooms, who loves playgrounds, and who got to go on the playground a whole lot – that’s even more sophisticated.


So oral expression will parallel your thinking ability, but you promote it by getting involved in things your child is emotionally invested in, and then you use that to build the child’s concept of logic and structure. Once you do that, you then help the child see what he’s done. Then when the child has to talk about something less emotional – why he likes a particular book or what he found the author’s main message was – you bring him back to when he was arguing about wanting more ice cream or when he was telling you about his favorite day at school – his main point, his supporting point, his examples. It will have relevancy for him and the oral expression is the same as writing the essay. Now, as we said before, when the root system and the tree trunk is firmed up – that’s why we started with the tree trunk and then we went to the root system – the academic skills come very easily and a lot of this is repeating things we’ve talked about, when we talked about the tree trunk and the root system, but I’m just showing how it applies to the academic skills.

Now we’re going to talk about written expression. When it comes to written expression there are two elements: One is just the ability to script out the regular shapes for letters in the words and to know how the words are spelled, and that really gets back



to language and reading and our phonemic awareness – to be able to make the connection between the sounds and the letters, which we already covered. But there’s the motor piece – can the child make the shapes to make the A’s and the B’s? Does the child reverse his letters, for example? Or does the child have fine motor challenges, where it’s hard for him to make those A’s and B’s and D’s, even if he knows and can say that you spell “boy” b-o-y or “Mom” m-o-m. So here we want to separate out what we’ve already talked about – the language and the reading and the spelling piece – from the ability to actually make the letters. Also, I should mention just one thing about spelling – spelling should be taught together with reading perception and with phonemic awareness – with being able to make the sound-letter connection. So when we’re recognizing the word we’re also teaching how to spell the word if the child is truly sounding it out. Maybe the child is just a good visual memory learner, but the child is also learning how to sequence those letters together and spell the word. So we’re not going to focus on that in this element.


In terms of the motor piece, some children need a lot of practice on their motor skills, just to be able to use their hands in the proper way to craft that A and the B. You’ll notice that some kids may even have beautiful penmanship, but it takes them a long time to shape that letter – it’s almost like they’re drawing it rather than printing it or eventually scripting it out real fast. Here there are two elements – we want to practice and get the child up to a level of good penmanship where he can read his own things and other people can; and then, two, we want to also help the child express himself in writing. So we want to give him alternatives, like with teaching a child who has fine motor problems to type very early and have a word processor that he can use to type. We want to teach him not to necessarily be restricted by the amount of effort it takes either to type or write (the motor piece) from the expression of his ideas. So we want to give him a dictating machine where he can dictate, then listen and copy what he’s already said because the writing takes so long he may forget what he wants to say by the time he gets the first word printed out. If the motor piece is very slow it’s a little bit like six lanes flowing into a one-lane tunnel – all the traffic gets backed up and you can see all the lanes are full. For a child who has fine motor difficulties, then, we have all these thoughts and all these great ideas, but the tunnel – i.e., the outflow, actually scripting the letter – is so slow that everything gets backed up, and when it gets backed up like that, two things happen. One, the child forgets the intrinsic logic of his argument or what he wants to say; and two, how does a driver feel when he’s waiting an hour and not making any progress – pretty frustrated, pretty angry, ready to give up. Many turn around and go back to where they started from or turn off and try to find another route. That’s what the child does – he gets discouraged, anxious, or angry and some just turn around and give up. Some children



avoid or some act out and become impulsive; some just get distracted onto other things. So we see all the common challenges, which can be viewed as ways the child is trying to cope with the feelings generated by being in that six-lane back-up, with only the one-lane tunnel – that tunnel being making your letters or shapes. That’s why we want to be flexible and offer the child a tape recorder, as well as typing. So there are many outflow channels for the written expression and, again, the child can then take his time, but at least his thoughts are recorded and he can do some of it or a helper can do some of it – in terms of writing or typing – while we work on improving their penmanship. But if you hold the child to master the penmanship first, you may lose more than you gain because while you’re improving the penmanship, you’re losing the ability to express yourself coherently and that’s the bigger loss. You can do both together and the child doesn’t have to do *all* the penmanship because you don’t want to tire the person out when his skills are weak.

Basically, the principle is when a fundamental ability – something in the root system – is weak, like fine motor control and motor planning and sequencing, particularly in fine motor, you want to have infinite patience and slowly remediate and practice that skill in a way that’s meaningful and fun for the child with short periods of practice so the child doesn’t get avoidant and negative. Children basically do what comes easy for them readily and that’s where either we’ll love to read and a natural drawer and scripter of letters will be a natural writer and they avoid things that are hard for them – that’s just the nature of being a child. It’s not until your teen or adult years that you can work on something that’s hard, consciously and volitionally – that’s not the way children are and as much as you want to lecture them, that’s not the way their minds work yet and they’re not thinking about the long-range future until they’re teenagers. So saying, “We’ve got to do this so you can be a so and so when you grow up or not have to be a so and so,” isn’t going to make sense to a young child, but it will make sense to a teenager.


So, here the key is, let’s work on that fine motor. The way to do that is to create a fun activity, don’t overdo it, be guided by an occupational therapist, either consulting to you or to the child’s classroom in terms of how to teach the proper holding techniques with a pencil, and start out with just scribble-scrabble and drawing and making different colors and shapes to make it fun. Then make big shapes – circles and squares and triangles. You can make people out of them or make interesting designs. Then get into your letters and initially just make maybe one letter on a page or two letters on a page where it’s easy to print it out and move from there. I won’t go into all the details, but there are many good programs out there on learning to do the fine motor control; just



remember to be guided by the child's individual differences. If it's predominantly a motor planning and sequencing and motor control issue, be very gradual and make it fun.

Also strengthen related systems, so do lots of balance and coordination and eye-hand practice, such as throwing and catching and kicking, walking on a balance beam, standing on one leg with your eyes closed, and seeing how long you can stand on each leg with your eyes closed; standing on a balance beam and throwing and catching without falling off; going through obstacle courses; climbing – those are all great support activities for that fine motor system because you're helping with your balance, coordination and you're helping with different parts of the brain – the cerebellum as well as your frontal lobes – when you're doing things like obstacle courses that require sequencing. So the key thing is to have fun, strengthen the whole motor system together, and do a lot of drawing and finger painting and play little games where you're crafting letters – it could be copycat games – and slowly strengthen that ability and work under the guidance of an occupational therapist – it need not be intensive work – but work under the guidance of a good occupational therapist to strengthen that fine motor.


Once a child can script out his letters or use typing or can talk into a tape recorder and then script out some and get help to script out others, we'll focus on the second part of written expression, which is creating coherent sentences and paragraphs and, eventually, a coherent little essay, even if it's just a three-line essay about "What I Liked At School Today." Here when we talk about oral expression it's exactly the same for written expression – it's a ditto. Start off with things that are emotionally meaningful to the child; help him see the logic of his argument and, therefore, the structure of an essay; and then implement it in the way he crafts a sentence or a series of sentences. You want to help the child by starting with emotionally relevant topics like his favorite food or why he deserves something more than his sibling does. In addition to helping him see the logic of his argument, help him when you get into the written part, to look at each sentence or each idea that he has and have him ask himself the question, "Does this belong? Is this my main point? Is this an example of my main point? Does this explain why my main point is true, that I should have the extra ice cream? Or is just this another idea or thought that I think is interesting?" People are reluctant to give up ideas or thoughts that are interesting, but not related to their main point. So, here, the way to do it is to put these extra thoughts – these interesting thoughts – on another page or side column, separate from the essay itself. "So, that's very interesting and that's something you may want to discuss. Why don't you jot it down here on the corner of the page or on this other page as an additional idea?" That way the child learns to discriminate – learns to tell the difference between points that are essential and points that are not. It's just a method of



analysis where you take each sentence and you say, “Is it part of my visual diagram that I created for my main point and my illustrations for my supporting points? Or is it something extraneous from that or is it something additional?” Then, don’t lose it – an interesting idea is something worthy of separate consideration so put it on another page. Here, too, just like for oral expression, this will exist at different levels, from basic “why” level thinking to multiple reasons for something, to comparative thinking and gray-area thinking to truly reflective thinking, and we can use the same exact examples as I gave you for oral expression.

Then, if the child gets more advanced and has to do research and write about things he’s less interested in, he’ll apply the same structure: What is the main point? What is he trying to say? How is everything going to connect together? The mistake we make in educating children to do this – because many children get to college and they still can’t write a coherent essay – is we go for volume rather than quality. Rather than take an hour or two with one essay, or even a whole week on one essay that may have only a few paragraphs or be only one page, to make sure the child understands it and can diagram it and can separate extraneous from relevant material, we tend to jump to another essay and another essay and another essay and not really work on the structure of the essay. So, here the advice to parents and educators is, “Slow down.” It’s better to have one well-crafted essay where the child really understands it and then do another one – you’ve got plenty of time – so the child “gets it,” as opposed to going for volume. If the child doesn’t have it and the argument is, “Well, he needs this for school, so we’ve got to get it done,” bite the bullet, talk to the teacher, send a note in that you only worked on one part of the homework and are taking responsibility because the child needed four hours or three hours or an hour – it should be no more than an hour, by the way – to work on that. Because if you get into the temptation to go for volume you’re in a lose-lose situation where the child will graduate from high school and not be able to do college work. Whereas, here, even if the teacher gives him a bad grade in the fifth or sixth grade, but he learns how to do the essay, he’ll be a good high school student and a good college student and no one’s going to look back at his sixth grade record, but they will look at his college record when he’s looking for a job. Also on the job it’s going to be very important in writing reports or in making an argument, whether he’s in business or sales or law or medicine, to understand this intrinsic structure of how to write an essay.

Now, also, we have creative writing and creative writing would seem to be a different “kettle of fish,” where you’re writing a story or a poem, yet it really follows the same lines of our essay, but at a slightly more subtle level because your story, too, has characters, it has a plot, the characters are all contributing to the plot, and everything kind



of weaves together. So a very good novel has a theme to it and each character represents a different side of this theme and embellishes it. Obviously, there's creative dialog, there's creative action, but it does fit together into a structure. If you talk to novelists you'll find that some of them just do this free-associatively – that it's just natural for them and somehow the structure kind of creates itself. But others really diagram a novel – they diagram the plot, the intrigue – if it's a mystery – and though they may change it many times, they literally have a visual diagram in their minds of how this creative endeavor is going to fit together. Painters, artists, musicians, those who create operas, composers all operate in the same way, seemingly through creative insight and inspiration, but there's an inherent structure that they can see after the fact or during it. My wife, who's a professional writer, learned that the way to organize – whether it's a biography, which is partially creative in the sense you put together the partial facts of the person's life, or a novel – what you're writing is to recognize that you're building around how the characters are meeting their basic needs, how the characters are dealing with the challenges of life, and you're answering basic questions.

So we won't talk a lot about creative writing here, because it's not a very big part of most academic programs, except to say that it really follows the same rules, but it's in many respects a more challenging process because you need that creative flow and that free-associative range, but you also need to satisfy the rules of making sense and having a logical structure, as well. So the same rules you teach for essay writing can serve well when it comes to organizing creative endeavors if you focus the creative endeavors around the characters and the plot and what your overall goal of this creative effort is.

Next time we're going to go into math and also the elements of executive functioning that we didn't cover in the root system and their relevance to academic skills, like following directions. Also, we'll talk about the role of anxiety and personality in being good at academic work. Next week we may record the show so that it airs on Thursday because I have to be away on Thursday, so check the website and we'll see if we can actually have a show for you next Thursday. If not, it will be the following week. Thank you. Bye bye.