

## **Web-Based Radio Show**

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


#### ***Planning and Sequencing***

**Stanley I. Greenspan, M.D.**

June 1, 2006

Good morning. This is Dr. Greenspan. Welcome to our web-based radio show. For those of you who tuned in last week we had a mechanical glitch and I apologize for not being able to bring you the whole show – I think you may have gotten the first seven minutes of it. So we're going to redo it this week. As you recall, we've been talking about learning: learning strengths, learning challenges, and learning differences and we've been using the imagery of the learning tree, with the tree trunk having to do with thinking and social skills; the root system having to do with all the processing abilities; and the branches and leaves having to do with the specific academic skills and other learning skills that we need. We've gone through all the roots and we're doing the remaining root, which we haven't discussed, which is the ability to sequence and plan – often called "executive functioning," which is actually a combination of many of the roots we've been talking about. It's a kind of composite root because it has elements of visual-spatial processing and auditory processing and language capacities, and also our sensory modulation capacities, and especially our motor planning and sequencing capacities. It deserves its own root in our image or our picture of the learning tree because it's so important and so many children and adults have problems with planning and sequencing. In fact, a lot of the challenges many of us have day to day is with difficulties in planning and sequencing – we don't do things on automatic pilot that we wish we did and we forget to do things and we make lists on our hands or make lists and check things off, but then we forget even to consult our lists, and kids forget to hand in their homework or forget to do their homework.


All this has to do with planning and sequencing. Even in conversations people get off-topic because they can't sequence their ideas well, or while writing an essay they bring in extraneous material or material that's not related to the topic or that doesn't prove their point because, again, they're not planning and sequencing their argument in



an organized fashion. So many creative people have trouble planning and sequencing, and many highly intelligent people in every profession have troubles – one would be amazed to see how many professors and physicians and attorneys and engineers and physicists have trouble with planning and sequencing, even though they're highly gifted in their particular areas. It may turn up in their inability to organize their home life or you may see them do what I do, which is putting things “pile by pile” and end up having huge piles of materials.

So, let's look at how we can strengthen this root and we'll do it by looking at it both as it starts – as we strengthen it in infants and young children and then in older children and adolescents and adults – but, also, for an older child, like a child with an autistic spectrum disorder or a severe learning disability who may be working at the most fundamental basic levels. So when we talk about what we do with a baby, we're also talking about what we might be doing with a four-year old who's just beginning to plan and sequence his actions. So, when we see, for example, repetitive activity, that's a child who has trouble with planning and sequencing because he's just in the same action over and over again; or a child who's just aimless and random is having trouble with that, too.


Now if we want to go back to the beginning and look at how it starts, there are a few principles that we want to keep in mind. One is that we always want to add more steps to the sequence to strengthen this ability. So whatever we're doing with the child, we always try to add more steps to it. Number two, always try to increase the child's interest in what he or she is doing so there's more emotional investment, more what we call “high affect,” because that helps us plan and sequence. For example, if you're arguing why you're better at something than your sibling, you're going to stay on point much better than if you're arguing why Mark Twain was a better author than Tolstoy or Faulkner. So, the key is to always be invested, which helps because the affect and the emotion help you organize and plan automatically, and the higher the affect – if it's not disorganizing emotionally – such as fear or anxiety, the better. So, for example, children rarely lose sight of how to get to the ice cream parlor if they're really hungry and want an ice cream, or how to get to the refrigerator, but they might lose sight of how to get to their homework assignment because there's not as much emotional investment. So, pay attention to adding sequencing steps; be very emotionally invested or pick things that you have a high degree of investment in for your child; and the third thing is to use as many of your senses – vision, hearing, touch, and movement – as possible. So, use



your sensory and your motor system as fully as possible. Get your whole mental team involved in your planning and sequencing actions. So, those are the three organizing principles.


Let's start with when we look at a newborn baby just learning to look and to pay attention to sound and to interesting sights. Well, when we're playing little games where the baby looks left or looks right, we can add steps to that game – the baby can look at us and we can go to the left and then go to the right. Once the baby gets good at that, we can go further to the left and further to the right, and then we can kind of move from the left back to the right and see if he can find us. Then we can move up and then down, and once the baby gets good at finding us and smiling at us and taking delight at seeing our shining, talking face, we can also complicate it by going up and down or left and right or horizontally, so that the baby has to begin looking in three or four places to find us and that's already helping that baby plan and sequence. As you can imagine, we're also strengthening the baby's attention. So many children, now, are diagnosed with Attention Deficit Disorder or attentional problems – even those who don't meet the criteria for ADD or ADHD – that we need to be doing more to strengthen this ability early on in life. When kids are just passive learners, watching a lot of TV or having a lot of screen time or just being read to, they're not having to learn to pay attention in the way you really *learn* to pay attention, which is an active problem-solving way, like finding Mommy's face. So the more steps you add on, the better the child's attention will be. We've seen babies who are very passive and very fleeting in their attention at three or four months and by playing these games with them we've gotten them, by 12 months, to be very focused and attentive because they're good planners and sequencers and they have the beginnings of what we call good “executive functioning” and good problem solving. Now, also, because the baby loves Mommy and Daddy and the more you play, the more the baby will love you, you become an object of great emotional interest. So, hiding your face and finding the voice tone that evokes a big smile from your baby is the ticket to helping that baby add more steps to his planning and sequencing. So that has to do with our first two stages of taking an interest in the world and becoming engaged with the world.

Then we get to our third stage of purposeful interaction; now we're talking about our six- to ten- or twelve-month old, where we're getting involved in back-and-forth communication and little sound games back-and-forth, little peek-a-boo games, where the baby's initiating a sound, we make a sound back, and he makes a sound back



to us – we call this opening and closing circles of communication. Well, here, too, how many steps can we make? Do we just play the same sound over – “Ahh!” and the baby goes, “Ooh!” and we go, “Aah!”? Or do we add different sounds on? The baby now can reach and gesture; do we add more gestures on? How many circles in a row can we get? Can each circle be a little different? So the baby imitates a sound, we put a rattle on our head and the baby begins gesturing towards it, and we take it and put it within reach and the baby touches it, and then we take it and hide it in our hand and the baby touches our hand. Now, that’s already five circles of communication. Can we get it to eight or ten circles, or twelve or fifteen? We try for a continuous flow by nine, ten, eleven, twelve months, which means the baby can do as much as we challenge the baby to do and can hang in there with us for five or ten minutes with back-and-forth communication. We add as much complexity as we can, so we make sure that the interactions have a visual component, that we’re putting interesting things on our heads or in our hands, where we hide them; that there’s an auditory component, where we’re always talking and vocalizing and trying to challenge the baby to vocalize back; that it has touch, where the baby can examine it; that it maybe has smell; and, obviously, that the baby is moving and organizing the motor system. We may take something and put it on the left side and then on the right side, so the baby has to reach over to try to find it. Again, the more steps we take, the richer the experience emotionally; and the more we get all the senses involved, the better the baby’s planning and sequencing. So here the simple rule is more circles of communication. For the older child, we want longer interactions and longer conversations; for the non-verbal child, longer back-and-forth gesturing.

Then we get to the next stage, which we call shared social problem solving, which is typically from about 12 months to 18 months but, again, we’re reworking this stage with many older children. Here’s where a child is taking you by the hand, walking you to the refrigerator or taking you to the toy area or pointing to the toy that he wants. This involves many back-and-forth interactions – many circles of communication – to solve a problem, to get your help. So to facilitate this, find something the child is really interested in, like a toy or a particular cookie, and put it in an area where he needs your help to get it. And then ask, “Ah! How are we going to get it?” See if the child can take you by the hand and show you how he needs your help. Keep complicating the steps. He may need to get your help where you can’t quite reach it so you’re going to need something so you can get up higher. Does the child have the idea of finding a chair? If not, you can give the child a choice between finding a chair or a blanket. Say, “What’s




going to help Daddy get up there?” If the child figures out to get the chair, he’s added another step to the problem solving, another step to the sequencing.

At this time we can also play search games where we hide things in both hands and the child has to search in one hand; when it’s not there, he has to search in the other hand. Or we can give him four choices – it can be in one of our hands or one of our pockets. We can kind of show him where we’re putting it and then transfer it so he gets the idea. The more places he needs to search, again, the better planner and sequencer he is. By 18 months we can put things in a room and we can have a little squeaking or talking toy that makes a noise and he’s got to find it. We can play a little hide-and-seek where we become the noise-maker, or we put the toy on our head if we’re not attractive enough ourselves. We can hide the cookie in a box that’s in another box that’s hidden somewhere in the room and we can give clues by pointing and showing. Now we have the beginning of treasure hunts and following directions. We can give vocal clues, some verbal ones, and also some visual clues, with lots of gesturing. The more complicated we make it and the more steps the child has to negotiate, the better problem-solver and sequencer he or she becomes.


We can also build obstacle courses now. So we get something the child wants – a favorite toy or a favorite cookie or find Daddy – and he has to go through the loop and over the steps and under the blanket and open and close the door and then finally he finds Daddy with the big, smiling face and the cookie in his mouth that little Junior or Sally can share. So, we keep adding steps to those obstacle courses. This involves, again, adding more and more sequences on. This stage can be very workable, also, for the child who has a visual or hearing impairment – he just uses all the other senses. So the child who can’t see can figure out a roadmap of the room by hearing sounds coming from different places and he or she can learn to search, as well, and add steps onto the problem solving. The same thing with a hearing impairment – we can use a lot of visual cues, rather than verbal cues.

Then we get to the next stage of using ideas, where the child is into pretend play and the question here is, how elaborate a drama can the child develop? Is it just simply the dolls hugging, which will start off at 18 or 20 months, or do they hug and then go to sleep and then get up and have a tea party in the morning and go to school? How many scenes can we have in our drama? Are they related to one another? As the child gets more verbal between the ages of two and four, how did the dolly go from sleeping to being on the airplane? We have to act confused so the child has to fill in the missing



pieces. “Well, they got up and they’re visiting Grandma.” Okay, well, now the child is a better sequencer. This is the beginning of writing a coherent essay when he’s 14 or 15 years old. So, how complex can the child make the pretend play? Even if it’s pretend and imaginative we can challenge the child to make sense so that one step is associated with another step and the drama makes sense. We can help the child go from the simple, repetitive drama to the “grand epic,” and as we’re doing this maybe we can have the child build the house where the tea party’s going to occur and find the chairs where the dolls are going to sit, so there’s a visual part and an architectural part. There’s a motor part in putting the chairs and the tables and the teacups in the right place – planning out the party, so to speak. There’s the verbal part, describing the action, what’s going to happen, acting confused when the child is going off on a tangent or not explaining what’s for dinner or what’s going to go inside the tea. You do this by being a character in the drama, not as an outsider asking difficult questions, but as another player in the drama, as a person who’s attending the tea party: “Ooh! What can I have in my tea?” or “Can I have anything to eat with my tea?” and so forth and so on.


Then we get to the stage of what we call connecting ideas together, where the child is learning how to answer all the “w” questions, including “why” questions. Here, we enhance the planning and sequencing by helping the child, again, make sense. Here the key is longer and longer conversations. Now that the child is logical we can not only do pretend play with the child and have even more elaborate dramas, but we can also find out about what happens at school. If you examine the child or, like a lawyer, if you cross-examine the child, he’s not going to want to tell you about school. But if you’re fun with it and say things more like, “Gee, I bet an elephant came to school today!” “No, Mom!” “There wasn’t? Well, what did you do?” Then you’ll likely hear about school. So you have to make the conversations fun but, again, the more details the child can share with you, the more you ask questions like, “Gee, what do you wish could’ve happened today?” or “What would you like to happen tomorrow at school?” The more you stick to the emotionally relevant thing, like “What was most fun today?” and “What would be fun to do tomorrow?” you can have the child add on more ideas, and the more ideas the child adds on, the more they’re sequencing and planning. What you would like to happen tomorrow is a plan. So even your preschooler can begin planning, not in terms of homework, but in terms of activities they like to do or a fun place they’d like to visit or who they’d like to play with or what they’d like for lunch or snack – things they’re very invested in – and this helps with the planning and sequencing. Then you can also say, “Can we get your snacks ready today?” and the child can lead you around putting



his snack together, and now you're getting a motor piece and you're getting a visual piece as the child organizes his little snack for tomorrow or organizes what toys he wants to take to school. So, we have a verbal piece and a visual piece and a motor piece and we're touching things – again, the child is using all his senses in a highly motivated way and adding more and more pieces on to the puzzle. So this helps him plan and sequence and organize, and this is very different from using flash cards to memorize letters or using flash cards to memorize shapes or just using a shape sorter, which can be a repetitive routine activity. At this point if you want to involve more complicated visual planning and sequencing you can take your shapes – your triangles and your squares – and build things with them. “Well, what do we need to build a house? What are we going to use for the basement? For the roof?” You can work on planning and sequencing, again, using all the different areas of functioning.

Then we go to what we call “multi-causal thinking” and here we're asking the child for more than one reason for something. If the child says, “I want to go outside?” “Why?” “Because I want to play.” “Oh. Any other reasons?” “Well, because it's nice and it's good to get exercise.” So we play a little game that's called, “How many reasons can you give me?” So we find something the child really wants to do and see how many reasons he can give for wanting to do it and, again, this is helping with planning and sequencing – this is the beginning of that coherent essay and the more reasons the child gives you, the more the child is really organizing his thoughts.

Now we can also do more complicated games and activities. It's always fun to start off with games where you create the rules and then try to stick with them. So we're seeing how well can the child follow a planned sequence of actions, but it's more fun if the child's the creator of the rules. So make your own versions of baseball and soccer and basketball, and start off with just Daddy and Johnny or Mommy and Sally or Daddy and Sally or Mommy and Johnny and do dance or ballet or musical chairs and create your own rules. The key thing is you're learning to organize and sequence and follow rules, and it's more fun to follow your own. Then you graduate to rules of existing games, but way before you have team sports and team dance and formal lessons enjoy the whole notion of games with rules and structure and start with your own creativity – it works much better that way. Start with just Mommy or Daddy and little Sally or little Johnny and maybe one friend and then maybe add another friend – but start with small groups; don't start with a large group of nine players on a big baseball field or five or 10 kids trying to steal the ball from each other on a basketball court, playing against each




other in team basketball or on a big soccer field with a lot of people running around and kicking the ball. Kids can learn as they stand in this place or that place, but it's not nearly as much fun because they have too many people and there's too much action going on and it's disorganizing for a lot of the kids unless the kid is very good spatially – soccer can be very disorganizing, for example. There's much too little action in baseball if you're just standing around in the outfield or on third base while the action's occurring between the pitcher and the catcher and the ground that's to the first baseman. So, start small, enjoy rule-making, enjoy following the rules, and start with a simple game with maybe one or two rules, then add three or four more rules on to it, then five or six.

So you can have a game where you're playing soccer with Daddy and the rule is you try to kick the ball three or four times in a row and get it in the goal, and Daddy tries to do the same thing. Then you bring a friend in and you see how many times you can pass the ball to your friend, then kick it, and get a goal. Then you go from there. Then you can have it that your friend can't get ahead of you and you can't get ahead of your friend – you both always have to be next to each other or one behind the other one. Daddy and his friend, who are playing against you, can do the same thing.


If you're doing ballet or other types of dance, start off with simple steps and then get more complicated with three- or four-step sequences. If you're doing music, you can do different arm movements to music and be like a bandleader. Rhythmic activity, listening to music, and being involved in movement is very helpful at this stage, as it is at earlier stages, too, and helps planning and sequencing. Here we can start off with simple up and down movements of the hand in rhythm with the music and then go up and down and sideways and left and right, being like a real orchestra leader. Then we can do different movements as we hear different instruments. If you hear the woodwinds or the trumpets or the piano or the strings you can do a movement that corresponds to each, and it can get very complex. So, here, we can use almost anything.

Children around this time are capable of drawing and doing more complicated motor things. Also they're learning to sequence in terms of motor things. Also they're learning to sequence – which we'll come to later when we talk about academic skills – in terms of numbers and letters and they'll see patterns, which all involve planning and sequencing. So here, too, we start simple and get more complicated, which we'll talk about later.




Now, as we get into organized games with more and more complicated rules to follow, if the child's having trouble following those rules there may be many reasons. His sequencing may be strong verbally, but weaker in the visual-spatial area, so he gets lost in the soccer field; or he can follow simple directions if you tell him what to do and they do well in school. Other children may do well on the soccer field if they're good at visualizing things and they may be able to follow a nice sequence or plan when it involves a lot of visual things or their motor system, but find it hard to use language and ideas to sequence. So, here we begin seeing lots of differences with relative strengths or weaknesses in different areas. The key is to help children who have these differences get stronger in all areas. So for the child who's a little weaker on the visual or the motor side, start with a simple soccer game and then go to the more complicated one. Start with a simple dance, and then go to the more complicated dance. Start with the simple obstacle course and then go to the more complicated one. For the child who's weaker verbally, this is where we enjoy treasure hunt games and we add on more and more steps. So we give the child some verbal, starting off with one or two, but then three or four and then five or six. Then we combine verbal and visual clues, so we may have a map and we may have verbal instructions, but we want to start out by giving the map and the verbal instructions separately; then we put the map and the verbal together. Then in order to follow the map and the verbal instructions you have to master an obstacle course requiring more and more coordinated motor actions, using the left and right sides of your body, climbing and going under things and getting around things and not touching other things, going faster through certain segments, then going slower. So there may be a time segment to the obstacle course, so you have to get to a certain place within a certain number of seconds; and in another area you might have to go slow-motion and take a long time to get from one place to another. So you can change up your timing, change up your coordination requirements, and combine visual and verbal directions, all in a multi-purpose obstacle course. So this multi-purpose obstacle course will have changing speeds – slow and fast – and different levels of coordination requirements – going over a balance beam or standing on one leg, closing your eyes, for example; and following verbal and visual directions, all to get to the goal of the special cookie or the special toy or the prize or winning points. We could even have teams competing with these games.

So you'll find both in following directions – from simple things like doing homework or helping out with chores around the house to these complicated games – that we can improve planning and sequencing. Now for the child who has trouble, go to



the games – go the high affect, high motivation, multi-sensory, gradually more complicated games so the child gets better at the fundamentals. Then go to the thing the child is less motivated to do, like chores around the house or homework, but get him to be a good planner and sequencer before you have him do the other things. The other thing you can have him do in the meantime – but simply – is to tell him to do something and have an incentive for doing it or a sanction for not doing it, but don't make it too complicated. We can organize, as I mentioned before, different teams where they're competing against each other for the treasure hunt with our complicated scenario, as we've talked about it.

Now at this stage we're getting into what we call "gray area thinking" and more complicated thinking and comparative thinking, where we compare A versus B. This is where we can have competing teams and we can have relative degrees of things. So here's where we change speeds, we ask for explanations of things that reflect on gradations of understanding, like, "Why do you like Johnny better than Susie? Or Susie better than Johnny? How much better? How many reasons can you give me?" So the conversations are longer and they're more elaborate, there are more degrees of things. When your child gives a reason for liking A better than B, each reason has a degree to it so you find out which is the most important reason, which is the second most important, and which is the third most important? And to the degree you do this with highly motivated situations like, "Why do you deserve more cookies than your brother or sister," or "Why you deserve a better holiday present than your brother or sister?" to that degree you'll get this more detailed nuance – what we call gray area thinking. As we get into comparative thinking and gray area thinking we can complicate the games more and complicate the planning and sequencing. Now games can have rules, but within the rules there are various shades of gray. So in flag football, how much contact is allowed? Can you brush someone? You can't knock them down, but can you bang into them a little bit? So the rules have to be interpreted now. This is all part of your ability to plan and sequence your actions effectively in the world, so you're learning when you're playing soccer or baseball you're only supposed to throw the ball to first base, but what happens if you don't think you can get to the ball to first base in time? Do you then throw it to the second baseman to make sure the guy doesn't advance, rather than try to throw it to first base, since you're pretty sure the guy will already be on first and then he may go to second by the time the first baseman gets the ball and throws it to second. So here's where judgment comes in and more gray area thinking comes in,




where you have to assess the relative degrees to which the basic rule of throwing the ball to first base is going to work.

It's better to help children master these steps in simple little games with two or three people, and then graduate to more complicated formal activities, like baseball. The more you work on gray area thinking and comparing, starting off with simple things like why you deserve more presents than your brother, then to why the Civil War was more or less important than the Revolutionary War, to why sometimes you throw to second base, rather than first base, the more you can graduate to different topic areas. Again, some kids will be better in one area than another, so we always want to strengthen areas where they're weaker, whether it's motor or visual-spatial versus language – we want to strengthen the weaker, as well as work with the stronger capacities of the child.

We always come back to our three rules: high affect and motivation; add more steps to the sequence – in this case, more subtlety and more comparisons; and the third thing is do as many of the sensory and motor skills as you can bring to bear on that particular problem at that particular time, always adding more and more steps on to the equation.


When we come to our next level, reflective thinking, where the child can judge how well he's doing at something: "I'm a little angrier than I should be today," or "I'm better at baseball than I am at soccer because my hand-eye is pretty good but my hand-foot is pretty weak," or "It's because my Daddy is the same way," etc. etc., now we're getting into more advanced planning and sequencing. The child can now be working on a more elaborate essay where he's comparing things, using gray area thinking, using multi-causal thinking, all to make a particular point and stay on the point. Here we can challenge the child. At this stage – where we'll go into the essay writing and we'll talk about academics – at this stage it's very, very important to help the child use all his sensory processing to help him with his planning and sequencing. So, here, visualization becomes very important. We find out from the child who's forgetting to do his homework what his or her game plan will be to organize their evenings. Here is a little exercise that helps plan and sequence and yet allows the child to be reflective about himself at the same time: The child has a big blackboard in his room and he lists all the things he needs to do for that evening. Next to each thing he needs to do, he lists how much he wants to do it, like talk to his friends, do his homework, etc., on a one to ten scale, using some of his gray area thinking. Does he want to talk to his friends – that



might rate a “10” and doing homework might be at the “minus 3” level – in other words, he doesn’t want to do it at all, but he lists it. He lists his plan – when he thinks he’ll get to each one. Then he’ll list a column with the likely outcome – does he think he’ll actually do it, or does he think he won’t do it? If he thinks he won’t do it, he lists – knowing himself – how he’s going to “finesse” his way out of it. Is he going to pretend to forget? Is he going to run out of time by putting it last? Is he going to throw a tantrum? Is he going to say it’s too hard? Is he going to get lost talking to his friend and extend that activity beyond its time or get on the computer and play computer games with his friends and, therefore, not have time for the reading or the math assignment? Is he going to blame it on his sibling? So the final column is how he’s going to justify not doing what he feels he’s not going to do.

By anticipating in advance and having this all on a blackboard, the child is making deliberate what he often does without thinking about it. So, rather than playing ostrich or entering into his world of escape routes, where he digs the hole deeper for himself in terms of planning and sequencing, now he plans and sequences his evening before the pressure is on to actually do anything; he determines the amount of interest he has in doing that, so we see where the emotion is and the joy is. Then we see what he thinks he’s likely to do – he’s making a judgment call, again, being very reflective; and then he’s telling us how he’s likely to finesse it or get out of it. Now this will take a while to help the child do this or participate in this activity because he may see it as his own undoing in the sense of not being able to use his favorite strategies to avoid doing things, but in the long term it’s a very effective strategy. It’s also very good for adults who are faced with lots of chores – doing a very honest appraisal of what they want to do, what they don’t want to do, what the chances of their doing it are or not it, and how they’re going to avoid doing it.


So instead of becoming unconscious or pre-conscious, it becomes deliberate and people take responsibility. So, part of planning and sequencing and sequencing at the more advanced stages is taking responsibility for yourself and for your actions and this helps with developing responsibility. By having it written out and visualizing it and then discussing it with someone else you’re using your verbal and visual systems and you’re also bringing in your higher-level reflective thinking skills to bear on this. Then, you’re doing the actions involved in actually doing it. Here we get into the child’s reflective capacities to understand himself. One child was telling me that as a young teenager, when he wasn’t very good at writing essays or couldn’t organize information, which he



learned to do in college, he said he would feel so embarrassed and so inept that he just had to avoid those feelings and he would just avoid any task involving writing an essay and not even try. In other words, he avoided the task until he got the hang of it and was able to do it in college, when he started enjoying it because he could make his point and argue like a lawyer. So, here, we get into that final column: the reason for the escape route, the reason for the avoidance. Here, you'll usually find that there's an uncomfortable feeling of ineptitude or inadequacy or anxiety – a fear of failure or other feelings – that motivate the strategy the child chooses to avoid doing what he believes he ought to be doing and what, often, parents believe he ought to be doing. Adults will do the same thing! So here is a very good opportunity to reflect on yourself and know yourself better and know your own strategies. This is a nice exercise to do that helps planning and sequencing.

Also at this stage we can get more creative. Children can do more elaborate artwork; they can create their own music if they're gifted musicians; they can create their own dances. So here there's a nice opportunity to go back and forth between mastering more complex rule-bound exercises and music, dance, sports, and other activities, as well as formal academics, such as essay-writing and interpreting more creative endeavors. Here's a chance, also, to be creative and create your own structure – to plan and sequence your own ideas and become the new Buckminster Fuller, become the new Picasso, or become the new Mozart, or become the new great sport star who invents a new move in basketball, or a dancer who invents a new ballet step. Here is the opportunity to be more creative and more disciplined.

Also, as we get into the more advanced stages of planning and sequencing it's very good to practice things – to put them on automatic pilot, to get things fast. My colleague, Harry Wachs, for example, who focuses on the visual-spatial side of this, has a number of exercises that are really quite good for planning and sequencing and these – that I'm giving – are a little different from Harry's exercises, but they build on his basic ideas where you can have children go back and forth between the visual and the language and the motor in a very rapid way. So, for example, a little game where you say a letter and the child has to figure out what number corresponds to that letter, like C is number 3 and D is number 4. So you're saying "D," he's saying "4"; and then you can give the number and the child has to tell you the letter. Then he has to tell you the letter that's one letter behind the number or one letter beyond the number or two letters beyond the number, and you make it more complicated. So, actually, you say a number



and they have to think, “Okay, what’s the letter that corresponds and what’s two before that? What’s three before that?” If they can do that very rapidly, they’re actually increasing the speed at which you’re matching up auditory language input with things you can picture and visualize. Then you could have the child not just say it, but actually write out the number or letter or pick it out; or you could have the child dance it out in a dance step. You can do this with following directions, too, where now we have speed-oriented, competitive treasure hunts where you’re given visual cues and auditory cues, but you can’t take the cues with you – they’re on a tape or on a piece of paper that’s stuck in one place. You can go back and listen to it or read it as many times as you like, but every time you go back you’re slowing down the treasure hunt for your team. So here we can work at speed to make some of these things more automatic for ourselves. Some of us are going to be very good at this, initially, and others will have a much harder time, but these are very good exercises for flexing your muscles.

You can imagine your own variation on these themes where the basic principle is to use language and visual and motor skills, all connected to one another in a very rapid way. I’ve been involved in the research for something called the “Interactive Metronome,” which is a computer-based feedback system that improves rhythmicity and timing and works on fine-tuning the nervous system. This is helpful not only in sports and music, but also in academic work and seems to help with attention and planning and sequencing from the studies we’ve done so far. So we can do a lot of rhythmic and music activity, including the Interactive Metronome, which helps get some of this on automatic pilot and gets some of these foundations established. Here, too, any time a child has a weakness, like in fine motor or gross motor or visual-spatial or getting lost easily, for example, or in following directions, we start simple and we build up and make it more complicated until the child becomes better and better at it. So every child will want to follow directions for a treasure hunt where they get something they really want.

We can help all children become good planners and sequencers by building up the individual components, by building up how their mental team works together, and then making it fun for them— always coming back to strong emotion and pleasure and affect; adding more steps on to the sequence; and using all their senses and their motor system together and making their sensory motor run – the full sensory motor team be used. If we do this, we have a lot of good problem-solvers and a lot of good planners and sequencers. The speed work done at the higher levels puts a lot of this on automatic pilot.



Thank you.