

Web-Based Radio Show

Visual-Spatial Processing and Thinking:

Continuation of 4/14/05 show – how we make sense; how we comprehend; how we think with what we see

Stanley I. Greenspan, M.D.


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Stanley Greenspan, M.D.:

Good morning. Welcome to our web-based radio show. Thank you for joining us. As you may recall, today we're going to complete our series on visual-spatial processing and thinking as a very, very important component of how to work with children with special needs and learning challenges, as well as with the children without challenges.

As we've discussed in the prior shows in this series, one of the most ignored and least attended to aspects of human development is how we make sense out of what we see. We take what we see and making sense of it kind of for granted, and it's interesting in the history of how we approach developmental challenges or how we approach understanding healthy development that we've paid language and different parts of cognition and motor development and social and emotional skills, and we've paid some attention to the visual system in the sense of what we call perceptual motor development – reaching and catching, drawing – but we haven't paid full attention to how we make sense, how we comprehend, how we think with what we see. As we also talked about in prior shows, Piaget was interested in this but never developed this area fully, but two individuals who worked closely with Piaget during the middle part of the century, Harry Wachs, a developmental optometrist, who's really become a cognitive theorist and his colleague, Hans Furth, who passed away in recent years but was for many years a professor at Catholic University in the Washington, D.C. area – they developed the visual-spatial part of Piaget's theory and their well-known book, *Thinking Goes to School*, outlines their theoretical model.

Serena and I have been working with Harry for many years and have recently incorporated his contributions into our DIR/Floortime approach where the "I" part – the




individual processing components – includes not just language and motor and sensory modulation and other sensory processing capacities, but also a very detailed roadmap of visual-spatial processing and thinking and, more importantly, principles of how to identify where the child is and how to promote it because what we find is that this can enhance thinking, just as language skills enhance thinking and just as other cognitive and social and emotional skills enhance thinking.

Today we're going to complete the series. We've talked about many elements of visual-spatial processing and thinking. Serena's going to lead our discussion, as she has in these prior shows in the series, to outline and then discuss the stage of visual and spatial thinking that has to do with the figurative and more symbolic aspects of it. But, first, she'll briefly review where we've been and then get into the new material for today's show. This will complete our series and then at the end, hopefully, we can talk a little bit about how this gets incorporated into fun, fantasy, and pretend, as well as games-type play that one can do everyday with children with special needs, but also children without special needs. Okay, Serena, why don't you take over?

Serena Weider, Ph.D.:

Sure. Good morning. I think this has been a very special focus for us because it is the area, as you just said, that's not usually recognized in great detail, since – especially with children with special needs – we always rely on their ability to see and use visual memory as the main ways that they learn. As we've come to understand the children more, we've been able to see how much it's not just in the visual memory and relying on what they see and seeing what they hear, whether we augment with pictures or signs or different kinds of actions or communication devices, but that, in fact, visual-spatial processing is an integral part of learning, thinking, feeling. It's been very exciting for us to be able to pull this into the way we look at development now simply because development is just not automatic for many children with special needs, and this is a very important area.


So let me just quickly go over the previous capacities that we've reviewed the last few weeks. We've organized these capacities, which bring a child to about age six –



the preschool years – in six different categories. So, first we talked about body awareness and body sense: We're born with bodies and recognizing and knowing where your body is and the different parts of your body is obviously the baseline since all our actions and thoughts and feelings are in our bodies. We went through the step-by-step development from year one when the infant just begins to look and follow and turn around and reach out and feel their bodies being touched or reach out and touch something to becoming much, much more purposeful, so by the time the child or toddler is in his second year, there's so much more awareness. Their motor system has kicked in, they can move, they can walk, they can use the body awareness to respond to other people much more, whether it's through imitation, whether it's reaching out, whether it's rejecting, but the use of purposeful movement really becomes crucial for so many visual-spatial kinds of games. This is where children begin to play peek-a-boo, they roll the ball back and forth, or they can throw something down that they don't want, or they see something across the room and go for it and get what they want and if they can't reach it, they pull Daddy or Mommy over and they point or gesture. So, again, we see body awareness developing as different components of development kick in and children become aware of where they are in space and where someone else is and this is when, very early, they begin to notice when they're bumping up against someone or maybe some other child, whether the child likes it or not, they get a reaction to it. They gradually begin to develop an awareness of themselves and their bodies, as well as others.

By the time the child is four or five their sense of their body is, of course, much further along and they know what they're going to do with their arms or their feet. They begin to play ball, they begin to climb and do more complex rough-housing games, they like to start wrestling, and they can carry out visions – they can go to work, they can unpack groceries, they can take something and give it to someone else in a different room or even nearby, but more and more, coordination of their bodies allows for more and more mastery of visual-spatial capacities and now they're skipping and jumping and riding bikes and playing ball games and beginning to follow rules. So, that is our very first level – a body awareness and body sense and knowing your body.

The second leads us right into the location of body in space. Obviously, these are overlapping capacities. Knowing where you are – your own body in relationship to each of its parts – your arms, your legs, your head – and moving each in some coordinated




fashion – and you’re beginning movement, along with your body in the environment and it’s very important as you figure out where you are and what you’re doing.

So, as an infant, it starts with very simple things – the baby may drop something and wait for someone to pick it up and look down to see where it is – that’s locating himself and the other object in space. Soon they’re aware they can move in space as they can develop those motor skills and do things they want – they have to make a lot of visual judgments for that. Are they going to bump into something? Are there stairs up ahead? Are they going uphill or downhill? Are you going to climb over the roadblock with Daddy lying on floor?

So they begin before two years of age, able to navigate not just themselves, but to take other things in space into account. As they master movements in space, they continue to also move in relationship to other moving things because to know where you are is one thing, but to know where something else is and that it’s moving is another. This is, of course, a time we really wonder about children’s judgment of location and space so the child can easily run into the street and not realize the car he might see way down is moving towards him and it’s going to get there and it’s going to be much bigger than it looks further away. This perspective is coming in between ages two and three, and by three and four children have more judgment and are more aware of what’s safe and not safe. We all are watching children like hawks earlier because they don’t have that capacity to understand things moving in space in relation to themselves. As they become more aware of moving targets, then you can start playing Duck, Duck, Goose. You can play Chase or Capture the Flag and start running and playing hide-and-seek and realize that you’re further away and not reveal where you are. By the time you’re four or five you’re much more able to use your body in relationship to other objects, as well. This is when you’re going to ride a bike or a scooter and know you’re going to be crossing space and can begin to estimate distances and aim for longer distances and see how far you can ride that bike or run or race.


So, as we move through the second capacity, by the time a child’s five they are very aware of where they are and this is where they can become team players, hopefully. Now, this is not automatic, needless to say, because many children will try to play a game and they’re just running around and playing soccer and kicking the ball here and there – it’s fine – but to really play on a team you have to know which direction to run in as you kick that ball – make sure you’re kicking it the right way – and that actually takes a few more years to develop, because it’s such a complex, fast-moving game,



unlike something like baseball, which is organized in a more systematic way: the bases are set, you know what direction to run in, somebody's waiting for you, and the task of locating yourself, the ball, and other players is a little simpler. Similarly with basketball, it's certainly a little simpler than some of the other activities.

As I mention these different skills you can see that as the child is getting older these become much more social and interactive kinds of activities. This is why these capacities are so important because they're not just for the purpose of throwing the ball, but who you're throwing it to, who you're playing with and how you're signaling and communicating and enjoying those interactions, which are a part of the relationship. When you have challenges, they can actually derail some of those activities and some of the fun you can have if you could do these things. Often we don't see children playing in the playground and we see them off in the corner standing by the fence and those are really clues to us that a child can't navigate that space and environment and interact within it. Recesses could be the most fun for children, because it's free and you do what you want, but they can also be very difficult for some children who can't negotiate the space and we want to be out there with them, and we want to be moving or mediating, or creating some kinds of practice to be able to play with the other children who are running around. It's very, very noticeable – it's very noticeable when you see kids unable to deal with space and maybe they're clinging to the monkey bars, or whatever, or standing on the side or just staying in the sand box and not really running around and having the fun other children can have. So, here we "clue in" in our evaluations and ask ourselves what's getting in the way. How much is body awareness and how much is dealing with body awareness in space?


How much of it is our next capacity, which is how do you relate to other people and objects as you look out into the world? That, too, starts from birth. Nothing is static. A newborn infant looking at a mother's face, or a dad's face, and smiling, is having to look and move and move his eyes and they're moving their heads, and they're cooing and talking so that it takes a lot of coordination of sight and spatial location, and certainly gravity as the child can hold her head up and then sit up and then stand up, but so much are reciprocal interactions and we've talked so much about that shared attention and engagement and two-way communications and reciprocal interactions in the first year or two of life where these are the core developmental and social and emotional capacities we're trying to support. So, here, we can see how this contributes to being able to develop these core capacities and it does take this visual-spatial



component of understanding where you are, how you move, where the other person is, and so forth. Think of the dramatic change of relationships by the second year where, suddenly, now the infant is not just taking in and looking and following, but now is acting upon objects quite actively and moving a lot and exerting a lot of self control and a lot of bossiness and suddenly realizing they can do things. So when a child realizes they cannot just drop something or pick something up or just put it into a container like a shape sorter, but that they can pick and find objects they want, and show you what they prefer, and build simple structures or feed the baby and put it in the carriage, or give it a bath or go put it to bed, they now are entering the symbolic world where they can use the different things they see and begin to show how they understand their experiences, in this case, usually reality-based experiences, but it could be with a baby doll or it could be with an elephant. The important thing is to see when they can imitate something, when they're "pretending," we know what's going on in their minds. Having the ability to make this happen is really remarkable and we'll talk about that a little bit more as we get to representational thought.

But as the children develop this understanding of who they are in relationship to others, they are also now beginning to substitute reality with symbols. The symbols can be movements, the symbols can be gestures, the symbols can be pictures or toys, and they are able not only to use the miniature version of the real object, they can also substitute an object. So, if they don't have that baby bottle and you want to feed your doll, they can take some other object – maybe the hammer you were using – and pretend it's a baby bottle. You can use a pencil, you can even use your finger, just as you can hold out and cup your hands and take a drink.

We move now, as a child becomes more representational, into these kinds of substitutions and gestures and children go back-and-forth between these different ways of playing. If they don't have something, they can use something else, and if they don't have something else, they can use a gesture or they can use a word. This is where a child is moving more and more towards an understanding of objects, an understanding of how different people relate to them and to other things, and he suddenly recognizes that when he goes out into the world people expect certain things of him. This is when children start going to nursery school. This is when suddenly the toy you're playing with – if you put it down for a moment to get another one – doesn't necessarily stay yours because someone else will pick it up and play with it. As they begin to learn the rules of social interactions, they begin to figure out how do they hold on to what they want, and




how do they negotiate back, or how do they join someone else and the objects together – are the toys together?

This is accompanied with a lot of cognitive growth at this point. We talked about object permanence, organization, we talked about organization of tasks – putting things in certain sequences. This is when children become interested in games like Candyland or Red Light/Green Light. They start to play games that have structure and organization, and simple rules. Where visual-spatial issues come into this would be, again, they have the object competence, they begin to get correspondence – one-to-one – so they're not just counting by rote and they can attach it on a one-to-one basis and they know exactly how many things, how many cookies, they're baking. They can begin to understand what's the same and different, what's bigger and smaller. They can organize things in a certain sequence to get to where they want to go. They arrange the furniture in the dollhouse, or they set up the animals in the zoo, or they build a structure and know they need bigger blocks on the bottom and smaller blocks on top if they want to build a tall skyscraper. It's no longer a tower; it's now a building.

And by the time they're five to six years old they also begin to understand they have to respect the territory and rights of other children and other people, and this is where we see a lot of social development, as children learn to make compromises and they make deals, "Okay, you have it first, I'll have it next – we'll divide it, we'll share it together" and they respect the boundaries of other people and now they know that just saying, "It's mine" or just saying they won doesn't really work any more. But they also know that some games you win by chance and some games you really just do move more quickly or in a certain way. As they understand these relationships they really work with the emotional components of being able to respect others, being able to understand how someone else feels – they're developing the empathy about winning and losing, as well as other feelings, and they are beginning to sense, "Okay, maybe it's not such a big deal if I don't win every time. I'll have another chance."

This summarizes the third capacity and as they move forward they're going to be moving more and more to cognitively driven issues where we are looking at conservation, and this is the ability to maintain an understanding of what to conserve – what things really are no matter what shape and form they take. So you can pour the water into a small beaker or a large beaker and realize you still have same amount of water that you started out with, or divide the clay into different numbers of pieces and realize that it's the same amount of clay. So whether we're conserving mass or liquids




or lengths, conservation helps children develop a sense of reality: what is really real. Conservation is some indication of whether a child understands that if you change form it doesn't mean you're changing the overall substance.

So, this starts out very early in life – and through all these capacities – by understanding space, and we're going to focus particularly on the conservation of space. In the first year of life space is very one directional – it's what we call uni-dimensional. So, when you look out, it goes one way. You drop something on the floor or you throw something out, you don't expect it to be able to also come back. You're only looking in one direction and you don't see it yet in reverse. If you get down on the floor then you might be able to look up, but if you're up and looking down, you don't always see the reverse. When children begin to realize space is two-dimensional, of course, is often once they're moving – climbing up a ladder to come down a slide is a good example of that. Later it takes more the form of are you going to jump off the diving board and a little up higher from the top than from the bottom.

At this point they haven't really looked at what the other direction is and it's only once they become really mobile – able to crawl, or walk around holding on, and finally move – that they begin to experience three-dimensionality because then they're moving in space, and space can change. We all know the delight a child feels when they can go up and then come down a slide; the delight they feel when they learn to be able to jump and cross space, whether it's down a step or into Daddy's arms in the pool. They realize that when they bat the balloon up they'll watch it go up and wait for it to come down. They're expecting the change in direction now at this point and, of course, as they move more and as they play more, they have more control over where they can bat the balloon or throw the ball, or who they want to run to, and who's going to chase them, and they can move in relationship to the object in space so they can play more complex games, and they can do more complex block designs or parquetry designs. It isn't only this one shape going into this one space. Now it's going to be, how do you line these blocks up to make this design or how to copy the parquetry blocks in the picture in the example before you.

With years four and five space just becomes much more fluid – the child can run in different directions, can have the sense of east, west, north and south. They know if they turn around in space, space isn't turning as well; they're the ones who turned. This is when children begin to play blindfold games like Pin-the-Tail-on-the-Donkey, or are willing to take chance of covering their eyes and reaching out to see if they can cross the




room to reach Daddy by hearing his voice, and that shows us they have an inner sense of space of that room and they know how to navigate around it. They're developing the sense that children who are blind or who have poor vision develop much earlier because they have to depend on their movement and touch and voice in order to create a sense of their space.

The conservation of space is pretty well established by five, six years of age in most kids. We know that with children with special needs we need to do a lot, lot of practice to help them develop this security of understanding space – and catching a ball and playing a ball, or maybe having the fun of taking a net and maybe finding a butterfly where they have to quickly move, go in different directions and not bump into things, not trip, and not fall down. One of the very common things we often see is where children simply plow through things in their way in space and don't even notice where their feet are – they just kind of step over things or don't walk around them or bump into things – these would be some of the things we look for to understand both location and conservation of space.

Let's quickly go through the visual-logical reasoning, which is where a child can apply logic and reason to understand what they see around the world. Visual thinking and logical thinking is where we make sense of what we see and, of course together with verbal reasoning, is the underlining component to thinking and later academic performance. It's probably most often in math and science, but it's essential really for all kinds of thinking – even verbal thinking involves visual-spatial thinking, but we're expressing it more through words.


We talked a lot about sensory motor actions. I think, Stanley, you were making the point of how important – unlike Piaget - children understand their actions much more in relationship to their parents when they look and follow and reach out and signal, way before they're dealing with other kinds of objects, and how the child then quickly moves up this ladder, as well, figuring out what works and what doesn't work. It could be around puzzles and it could be around shape sorters, you're trying to problem solve – can you fit this into the space that you want and is there enough room to hold all your M & M's, are things the same or different? As children develop correspondence, as they can move, they are really trying to understand why something works or doesn't work with regard to size and shape and trying to make things fit. An example I'm always giving here is when you see a younger child trying to use a doll's boots or ride a little car or a horse, you realize that they don't yet have that regard for size and shape and if it



looks like what they're thinking about, then they're going to try to use it. Of course we let them discover if it's going to fit, or not fit and find some way of symbolizing it. Whether they then use a figure to ride the horse or whether they find something bigger that they can actually ride on and enjoy the sensory motor movement will depend on what they're seeking themselves.

We see this transition happening when they can make sense of their visual world and when they can put things in a certain order so that they are able to figure out what's more or less, what's bigger or smaller, how far they have to climb up to reach something higher, how deep they have to climb to get something deeper. They're using more and more things that we've talked about before, which is that one-to-one correspondence, conservation of number in space, they're beginning to understand probability – how many of these pieces can I get if I do this or that – so, should I pick an orange from a basket of 10 or a basket of 2? What are my chances of getting the one I want? They're beginning to see the relationships between objects and this is when we see a lot of conceptual groupings that children can make. They can find all the big red triangles out of a group of different attribute blocks and they can think in terms of multi-dimensions in their search, as they need something to meet many different needs. So kids are no longer fooled by appearances, and they are really beginning to figure out what they're looking at. And, here, too they're developing a sense of reality. As we said in the previous session, this is a process that actually takes about three to four years as the children begin to get representational between three and four and go from the reality of what they see and begin to test what's in their minds.

So, things aren't always the way they look, but they're really a combination of what you see and what you think and how you reason and what you want and who you want to share it with, and this ushers us into representational thought and this is the last core capacity. We've referred to this many times as we've described the other capacities, again, because each of these things is not really separate. They don't have their own line of development; they're continuously interacting with each other. Representational thought is when we can think of something in another form, so we can take something in reality and represent it in another way. You can draw a picture of something, you can pretend to be moving like something else – you can pretend to be a horse galloping through the fields and use gestures and movements, that's motor imagery where you use your body. We can use toys to represent the real thing, and we know that starts very early, even before they turn one children are beginning to play




with toys that represent reality and do it as if it's real, but then they begin to see this is only a substitute for reality and then they can move more into their own thoughts. But when you can think of something where one form represents another, you're able to move into higher level thinking capacities and take space and time into account. So how does this begin?

During the first year of life, things are what you see. Everything is really pretty much direct. Let's say the child wants some juice or is looking for their bottle, they're bound to be able to represent it usually just through some vocalization – “eh, eh, eh” – and parents will say, “Oh, what are you thinking of? What is it that you want?” As they have more motor capacities, they can try to point to what they want and they will reach toward or point to something, but it's very direct – it's direct, it's looking for the real thing, and an action may get them the real thing. Well, imagine what happens in the next year. By the end year two, the child now can use a word to tell you what they want. It's no longer, “eh, eh, eh,” or pointing for juice, it's, “I want juice, I'm thirsty,” and they can ask for it even if they don't see it. Whereas in the first year they have to see what they want, by the second year we know it's already represented in their mind. They can feel the thirst, their minds can picture what can satisfy their thirst, they begin to make choices about what they'd like to drink in their mind, and they can actually then ask for it. Even if they're not verbal, we know they can go to the fridge and open the door and get it, or climb to the cabinet and find the cookie, and they'll accept one and not another because they have representation of their different desires and they're not all the same.

So, unlike in the first year when we can get away with giving the baby what we want, in the second year children are already able to retain this representation of what they want and begin to show their preferences and have their opinion, and they're going to convey this through a combination of gestures, construction – building the house they want to, building the garage they want to put their cars in – and they're able to represent the baby with a baby doll and they can use the toys to take their journeys, and they can fix them with their tools, they can push the little toy swing, and in their eyes they're getting the same pleasure as if they were doing it for themselves.


So now there's no issue – they begin to understand these are small things – they don't do the real thing, but can pretend as if they're doing the real thing. They can think, “I can't go out in the park, but I can pretend with my toys” and they can present their wishes and their desires and, later, the things that scare them or the things they



love playing with. At this point in the representation, children don't just think in terms of space, so everything is wherever it is and if they want to fill their car with gas, it doesn't really matter if it's on top of the garage building or on top of the train track, or in the house – they'll do what they want wherever it is in space and it doesn't quite make sense yet. It's not quite logical yet.

By the third year it's quite amazing to see how children begin to develop this context. They begin to see the representation in the environment and they can construct a kind of a total picture, but it's based on their actions. So, yes, they're going to move through and they're going to begin going into space and taking their little spaceship or their little tube from a paper towel and go zooming into the air, and they're not really looking where they're going to land, but they really have the idea that they can take something and move somewhere, and just thinking about it gets them there. So they're not trying to really arrange how they're going to go from the pirate ship to the land – they're leaping up to the castle without having to climb up the wall. They're able to go from bed to the bath without even moving their toys from room to room. At this stage, the children have the thought and they can see parts of their thoughts, but they don't yet have the visual-spatial component of locating it and getting there in some kind of logical way. So, they're doing what they're thinking of and not worrying so much about where and how are the steps of getting there.


This is early imaginative play, and it's just wonderful because it's the period of magical thinking – they can do whatever they want. Many children have magical images, so they have magical wands and they're wizards and then, of course, there are the witches and the ghosts and all of this is all very real – it can come out of nowhere and is found everywhere. This is the wonderful period where children begin to represent some of the things that frighten them and they're trying to figure out what's real and not real, I mean – after all, are they're witches or are there monsters or are there ghosts? So we can walk around the room and check the closets, look under the bed, open the window and chase out all the demons so they won't be frightened because we're not yet working with the reality – we're working with their imagination and the things that frighten them could be anywhere and everywhere. We go through the motions of helping the child because if you just tell them they're not real it won't make any difference. And we know we don't want them to know the reality of everything, anyway. I mean, after all, imagine if you're three and four years old and you've figured out who Santa Claus is, you'd be robbing the child of the enormous



meaning of Santa Claus and the Easter Bunny and other parts of our imagination that represent so many wonderful wishes and potential and possibilities and hope.

By four, this representational thought is now becoming much more accurate, much more purposeful. So at this point you don't just go around and point your finger and shoot all the bad guys or get all the dinosaurs. It's not so easy anymore. Now you need a strategy – you have to figure out, “How am I going to use to get that? Should I come from behind or should I stand on the side? Should I set a trap or an ambush?” and the child is trying to orient in space a lot more, not quite able to do it in a clear-cut way, but experimenting with developing a more realistic visual strategy to move across space to get to where he wants to go, to be able to accomplish his mission, whether that's through construction – and this is where we also begin to see drawing – the child can now scribble and tell you what he's drawn and begins to get the rudiments of representing the figure. When we assess and we ask somebody to draw a figure we're not so concerned about how they drew it, what we really try to see is how many parts of the body they represent. There's actually a figure drawing test and what we do is we ask the child to tell us what they drew because it may not be so clearly represented, but if they're thinking it, they get credit and even if it's a little scribble or a little mark, it shows us the complexity of their own body image and how they visualize the body parts in their mind, and that's enough. Within a year later we actually see children able to use pencil and paper, their graphic motor abilities are kicking in, and they can begin to at least represent two-dimensional space.


But now what we're seeing is that the child is actually trying not only to imagine and pretend, but they're including space in those thoughts. It's very dramatic to see if you have a child who's trying to build a train track and if there's something in their way – a building or a mountain or a boulder – what they'll basically do is go around it – they'll take the track and they'll go around the thing that they see. Whereas within a year later what you'll see a child doing is deciding to build a tunnel, and they will go through the motions of plowing through the tunnel, taking out the dirt, really able to see that train going right through that mountain even knowing it's there when they don't see it, whereas the four-year-old is still going to want to keep seeing that train and their track has to be much more visible because if they want the train to go through the tunnel it would take being able to visualize the space, how to construct the tunnel, figuring out how long it would have to be, how big it would have to be, and being able to get to the other side, knowing that they'll reach the other point and anticipating it.



So, here, as children play imaginatively we see much more complex actions of this kind as they build their tunnels or as they develop a strategy or as they have a way of cornering a Brachiosaurus with all their T-rexes or they get all their plant-eaters and develop a trap for their T-rex, but they're able to move in many directions, they're able to anticipate how long it takes to get there, they're able to use motor images to make it happen, as well as words, and as well as their visualization to be that architect of their fantasies, their imaginative play or in their construction of a building or in a drawing.

By age five we see children really beginning to draw and in some cases this is also when you begin to see children do things like letter reversal or writing the word backwards. They still don't have that visual stability, but usually we don't have to worry about it at this age because it's a developmental process and it will come, and by age seven or eight this has been resolved. This is also where you begin to see – especially in children with special needs where you have more auditory and language difficulties – many of them are able to really show us the complexity of their thinking and their imagination through drawing. While they may start out just drawing their favorite figure, I can think of one little boy who always loved to draw different kinds of battleships. He would have the bigger ones and smaller ones. He went to a workshop and he built these battleships and I would watch and see how he was able to draw that battleship in the sea and in the water and make the waves smoother or higher, and then he was able to draw the battleship in relationship to other ships, and then he added the airplanes that were trying to come in and land on the battleship or to attack, and as he drew I could see how much more complex his thinking was because his drawing was able to tell me what he had in mind more than his words could and we find many, many children able to use drawing to represent a lot of their thoughts.

Just yesterday I just saw this wonderful little book this little girl did. When we tried to play just with the toys – she would arrange and put them here and there, but she couldn't express the story that she could draw by drawing six pictures in a sequence of children getting ready for a performance. She was about to play in a little school performance in her kindergarten class and was actually quite anxious about it. She drew getting ready and costumes and children walking on stage, it was just amazing, so by the last slide she even had the backs of the audience from the perspective of the children on the stage, as well as the props and the decorations and people smiling and clapping and I thought, my goodness, if she hadn't had that capacity for drawing this way, we would




not have known how deeply she's thinking and feeling and, in fact, she even drew a child kind of in the corner looking timid.

We have to find every avenue to represent thought – for many children it's gestures and this is why playing Charades without words strengthens a child's ability to show you what they're thinking, what they want to do through mime. I'm always encouraging people to find a Marcel Marceau tape because it's quite amazing to watch how much gets conveyed and children will love this. There are games like Kids On Stage and other kinds of drama activities, and sometimes we just say, hey, What if at the dinner table everyone didn't talk for a minute and they wanted to get some more French fries or they wanted a drink or somebody was asking them to pass a napkin or the pitcher of water, and just try doing it through gestures – so much can get communicated that way and in fact it actually strengthens looking and communicating without words and having to be much more direct.

Whether the representation is in these movements and gestures, whether it's in drawing, whether it's in words, whether it's the use of toys, all of these can convey what is going on in a child's mind and the important thing is communicating it with someone, being able to share it with someone and getting in there working together to develop the drama and enjoying the play. In other ways, this is a wonderful way to find out what children are thinking about and what they're worried about because as we let them choose their toys they want to play with or the activities they want to do, we get a very good sense of how they're feeling and what they're doing and we can actually use these other forms of representation and not just our words to empathize or ask questions or problem-solve, but we also need to use drawing, that's a very important avenue for children who do have more language processing challenges and I'll always encourage not just drawing a sequence of what your scheduling is going to be like, but to actually draw the stories or draw the things that a child wants to do next when they have to make a difficult transition or draw the pictures of their ideas.

But this is the baseline of representational thinking, which, of course, sets the stage for all the academic work that's to come and we do know that developing these capacities to represent and sequence thoughts and ideas and feelings really will become the basis for comprehension of what children will have to learn, whether it's verbally or visually, and it's the tons of practice that we get when we do those six to eight sessions everyday of Floortime activities, and the other essential motor activities, and drawing




and playing games and working with blocks that will help the child be ready to learn into the future.

Well, I think I talked a lot, and I hope that we can now maybe just spent a few minutes connecting all this. You can see from all the examples I gave the huge overlap there is with the bottom line being, What are the interactions? How are we continuously engaging and interacting with the children to create these different ideas, and to build bridges for these ideas and then to move into abstract thinking. That's such a big topic that maybe we can talk about this at another time. Did you want to add something?

Dr. Greenspan:

Thank you, Serena, this is really excellent and I think everyone now has a very full and rich visual picture of the different aspects of visual-spatial processing. As Serena was talking and giving some of her examples, I was thinking of how we can simplify this in some respects so that the practitioner or the parent or the home Floortime helper can work with the visual-spatial world as they're working with language and communication skills through Floortime. As you know in that basic DIR/Floortime approach, one important component of the home program – in addition to the professional therapies – is to get down on the floor, follow the child's lead, harness their interest and get it cooking, which means mobilizing all the functional emotional developmental capacities and levels, from shared attention and engagement, all the way up to gray area thinking and reflective thinking. Interestingly, each level – each of our levels from engagement to using ideas in their most simple and basic form, like feeding a dolly, to more advanced types of reflective thinking, like the kind of games Serena was saying, where you have battleships and airplanes and submarines all interacting with each other and figuring out different strategies where the good guys are getting the bad guys, or where the anger is winning out over love, or love is winning out over anger, hopefully – as we get to these different levels we can look at the different components that can organize: the language component, the visual-spatial component, the motor component.

So our ideal play with the child is basically to integrate all these pieces together: emotional, social, language, motor, visual-spatial as part of your interactive play, and the way to think about this is to think about our functional emotional developmental




capacities, from attention and engagement, always up to reflective thinking and then saying what level are we operating on and how do we make this as rich as possible and how do I bring in all the pieces – language, visual-spatial and motor.

So, here, just to focus on the visual-spatial, if you want to provide practice for the child at all the levels that Serena has described over the last few weeks, think of games in Floortime where you get the child moving so the child is crawling, or even just squirming on the floor, then crawling and walking, then ducking under things and avoiding obstacles, to moving their body in space, having to deal with their body and an object in space, where the child is catching or throwing balls because they're avoiding the evil monster's bombs, or they're getting the magic fairy's fairy dust by following the bubble and catching the bubble. That's getting at some of the basic levels of visual-spatial thinking.

Then as you're moving on, the child needs secret codes where they have to copy your block designs in order to figure out how to enter the castle. Then they're going to have to draw a complicated diagram of how to defeat the enemy or how to develop the new dance step that's going to be part of the ballerina show that they're planning, and so forth and so on. And as they're doing this there's the voice from the sidelines of the drama – the director of the drama – who's the child, actually, moving out of the role of the drama player to the director role, commenting on how the drama's going and what pieces need to come in next and how they feel about the drama and what they like and don't like. So they become the sideline commentator, as well as the parent helper or the Floortime practitioner helper.

So, in this way you can see how you can build in the visual-spatial world into the dramatic play along with language and motor, and other skills, but they're all organized by the child's functional emotional capacities. So, keep your eye on where the child is in terms of engagement, back-and-forth purposeful signaling, shared social problem solving, using ideas, using ideas logically and then higher levels of reflective thinking and saying, "What do we have to work on in the visual-spatial world? Are we working on basic movement, tracking, ducking in and around things, catching, throwing, the issue of the self and the objects in space, or are we working on that plus higher-level skills like copying block designs or drawings where we're symbolizing space? Are we creating space innovatively where we're building new castles and new bridges and new tunnels and new roads to places?"



So all this can be built in to your wonderful play and with a child is doing very well, is really cooking on all fronts, all this happens naturally and very smoothly, so you don't need to be thinking about all these things, and I think for the parent or the Floortime practitioner, or even the clinician, the idea is to keep one's eye on the most important things: Where are we in terms of our functional emotional capacities? Are we harnessing as many of the motor and language and visual-sp capacities as we can at that level? And try to develop a roadmap in your mind where you hook onto each of the functional emotional developmental levels – the related language, visual-spatial, motor, and sensory pieces. When you do that then you can begin teaching others how to use the DIR/Floortime model, so that's something to aspire to that clinicians aspire to, and I've seen many parents who do this intuitively and wonderfully. That's the end goal of really mastering this approach that we've been talking about.

Serena, thank you very much. This is wonderful today – do you want to add anything?


Serena Weider:

You're welcome. I just want to add one point to what you're saying, again, which is how important it is because as we see more children come in more constricted and having certain things they want to play with, how hard we really want to work to broaden those interests so they can get in all those rich experiences. That would be one very clear indication that we need to do all the things you were mentioning.

Dr. Greenspan:

Right, and the way to broaden that interest is always to come back to the basic principle of making it fun for the child by building off the child's basic interests so they want to copy that block design, or they want to duck in and around the obstacles or crawl through the tube because they're getting to the other side to get something they really want. So the idea is to take advantage of their natural motivation, or create it, which means following their natural affects and emotions.

Thank you again, Serena, and thank you all for listening. Now next week we're not going to have a show because next week is our training conference. As you know every April – the last week in April – Serena and I do a four-day training conference on the basic DIR/Floortime model. We know that many of you are planning to attend, so we have a good group attending this in about a week and I will be looking forward to



seeing you there. So we won't have a show next week, but in two weeks we'll resume and then we're going to have a very interesting topic, a very important one, probably the one I get asked about most frequently and we're going to call it Meltdowns and Tantrums – how to deal with them and turn them into constructive learning opportunities. So, Meltdowns and Tantrums – how to deal with them and turn them into constructive learning opportunities. For some reason spring seems to be a time of meltdowns, because we're getting more and more questions about meltdowns, so we'll talk about how to figure out how why they happen and what to do about them, and how to turn them into constructive opportunities.

So we'll hear from you in two weeks and hopefully communicate some useful information at that time. For those who will be at the training conference, we'll look forward to seeing you there. Keep well and we'll speak to you again soon. Bye. Bye.

Dr. Weider:

Bye bye.