



**TURN AUTISM AROUND**  
WITH DR. MARY BARBERA

Transcript for Podcast Episode: 053

*Dr. Mark Sundberg — Using VB-MAPP to  
Assess and Teach Language*

Hosted by: Dr. Mary Barbera

Mary Barbera: You're listening to the Turn Autism Around podcast. I'm your host, Dr. Mary Barbera, and I am thrilled that the first episode of 2020 of the new year and the new decade is an interview I've done with a special guest, Dr. Mark Sundberg. Dr. Sundberg is the author of the VB-MAPP assessment program and I use the VB-MAPP almost every day in my online courses in what I talk about and how I try to help kids with autism.

Mary Barbera: So I hope you enjoy this podcast episode. It is a little bit longer than most of my episodes, but I think it's well worth it. And towards the end of the episode, Mark and I talk about a new surprise announcement that I am making in ways that I, and hopefully all of you can help disseminate this great information a little bit broader in the coming year and years. So I hope you enjoy this special interview with Dr. Mark Sundberg.

*Welcome to the Turn Autism Around podcast for both parents and professionals in the autism world who want to turn things around, be less stressed, and lead happier lives. And now your host, autism mom, behavior analyst, and bestselling author, Dr. Mary Barbera.*

Mary Barbera: So I am so thrilled to have one of my favorite mentors here, Dr. Mark Sundberg. So thank you so much for joining us here today, Mark.

Dr. Mark Sundberg: Welcome.

Mary Barbera: I have been trying to get you on for many months. And so this is just a thrill to have you for as long as we can have you with your brilliance. So the way I like to start the podcast is to describe your fall into the autism world and the ABA world. And I know you go way back and have a lot of history, but can you briefly tell us about your work in the seventies and eighties that got you interested?

Dr. Mark Sundberg: Sure. Well, I accidentally, I would say stumbled into a incredible environment at Western Michigan University, which was a fully behavioral psychology department at the time. And it just happened that there were a good collection of behavior analysts that were developing the field, actually, at that time in the early seventies, really behavioral modification was just coming of age; behavioral approaches; behavioral methodology was just beginning to become popular.

Dr. Mark Sundberg: But at Western Michigan University, there was a clinical setting called Kalamazoo Valley multi-handicap center. And that program was directed by Jerry Shook and almost all students, certainly all graduate students, but all undergraduate students who went through Western Michigan's psychology program were required to do a 10 hour a week practical. And Jerry Shook's program was one of the practicum sites and that's where I did my practicum. In the same semester I went out to work with Jerry Shook and, and other individuals. I took Jack Michael's class on verbal behavior. So that was 1974.

Dr. Mark Sundberg: So that same January I started learning about mands and tacts. I was starting to work with children for the first time. And that was quite an experience; that semester basically set the course for the rest of my career. I eventually became a full time staff member at the multi-handicap center. And in that program we had about 60 students. It was run through the public school system. Kalamazoo Valley intermediate school district. We had individuals from basically one, one and a half years old, all the way up to 25. And so it was a wide range of problems. Many of our students lived in the Kalamazoo state hospital and came from the hospital. Many of them were on their way to the state hospital. And this was sort of a last step.

Dr. Mark Sundberg: But you know, again, in the 70s it was, it was not uncommon to institutionalize down syndrome kids and other kids with autism or whatever other behavior problems they may have had. So this was a population that most people, really, most professionals didn't really know what to do with them. They weren't sure what to do with a nonverbal 15 year old kid that was highly aggressive other than institutionalize and medicaid. The notion that you could teach the child to engage in appropriate behaviors and reduce the negative behaviors was not well developed at that time. At the multi handicap center, I ended up working there six years full time. So all through my graduate masters and doctoral program, I worked at the program during the day and we had the nonstop flow of Western Michigan university students. And these students would come into the program in their junior year.

Dr. Mark Sundberg: So they had already had a rat lab with Dick Malott. They had human development class. They had had Jack Michael's verbal behavior class. They had had an abnormal psych class as their fourth class, their fifth class in the curriculum was called applied behavior analysis. So now they came to the applied area after having those four courses and then they came out to our center. So our entry level, hands on staff had had verbal behavior had, had a rat lab, had had abnormal psych and had this behavioral history. And we were all set up on a one-on-one intervention. It was a basic, I'd say one of the earliest ABA style programs within a public school system. But again, bringing students in at that entry level was incredible. And we really didn't know what we had because we didn't have much to compare it to. But we were in this environment where everybody talked behavior analysis. Most everybody had had verbal behavior courses. Most everybody knew the basic principles and concepts; what they didn't know was children. And that's what we taught them that as they worked in the rat lab, now let me show you how to do shaping with a child, show you how to fade out prompts cause you can't fade out prompts very easily with the animals and section. So there are a lot of, a lot of differences.

Mary Barbera: Wow. And your dissertation was published in 1980. And that was under Jack Michael was your dissertation chair?

Dr. Mark Sundberg: Yes. Yes. Jack was my chair and Brian Iwata was on my committee. Brian and Jack were our research consultants at the multi-handicap center and they used to come out to the center pretty much every week for our research meetings and such. And in that time period with Jack.. at that time, Jack was very interested in verbal behavior and we had a number of his master's students and doctoral students who did their master's thesis or dissertations verbal behaviors. So the very beginning kind of things that Jack did with us was first kind of teach us how do you establish a mand repertoire tact intraverbal. How do you establish and teach these repertoires and how do you control motivating operations, contrived, motivating operations?

Dr. Mark Sundberg: Then we progressed into a series of research on the distinction between the mand and the tact, the distinction between the mand and the intraverbal, and that collection of studies. My dissertation was basically, I had six kids who were pretty much nonverbal, and we taught actually all six kids learn sign language. They were all non-vocal, we taught them all signs, they all acquired mands, tacts, intraverbals. And so the dissertation was basically the application of Skinner's analysis to establishing a verbal repertoire. And that was a lot of fun.

Dr. Mark Sundberg: Which, you know, you've been a huge mentor to me. I first came across your work with the Abels in 1999, 2000. And we had just started Lovaas type ABA with Lucas in 1999, when he was diagnosed the day before he turned three. So when I transitioned from a Lovaas approach to using the Ables and back then it was a very primitive kind of, nobody really knew what they were doing kind of program. So, you know, I got my start in the Lovaas approach, and I do think that... It's in my book a little bit, The Verbal Behavior Approach, which of course you wrote the forward for my book, which I'm eternally grateful for. And you know, there is still a lot of kind of old school, traditional ABA trial without a huge bringing in any parts or a big part of Skinner's analysis. And so well Lovaas really contributed to the fields immensely, especially with his hallmark paper published in 1987 which you are doing your work in the seventies and eighties. And you were, you were using all that behavior modification at the time, but bringing in Skinner's analysis of verbal behavior.

Mary Barbera: So how do you see traditional Lovaas and traditional approaches to ABA versus using a verbal behavior approach?

Dr. Mark Sundberg: Sure. Well, what Lovaas did for us and all of his colleagues is really kind of lay out the basic teaching procedures for establishing imitation tacting, which he called expressive labeling and receptive skills, and so on. That is the application of basic behavior, mod prompting, fading, shaping the structure, the teaching arrangement and so on. And those were all really critical to establishing instructional control, developing skills and so on. But Lovaas like most everybody in the early seventies or when it came to language were pretty much using the expressive receptive framework of language. That is when Bear and Lovaas and others were at the University of Washington at the kind of birth of applied behavior analysis. And in Washington there wasn't really much known about mands and tacts and intraverbals.

Dr. Mark Sundberg: Skinner's book, people didn't know what to do with it. They didn't know how to apply it. They weren't sure what to make of it. And the book came out, there was no applied field really in the 1950s. People were interested in the experimental analysis more than the applied field, and so none of the concepts really were well developed.

Dr. Mark Sundberg: What we basically did, and this was at the direction of Jack, was coming from a verbal behavior standpoint, we're looking at various kinds of verbal operants and kind of noticing or identifying that the mand repertoire for example, is not a big part of traditional linguistics. It was not a big part of the expressive receptive. It was never a big part of Lovaas' earlier work or anybody else. People just weren't looking at the

mand relation as separate from other types of language. And basically what Jack had us do was simply incorporate, let's get the mand, make sure these kids can mand.

Dr. Mark Sundberg: So we're adding manding to imitation and echoic and matching the sample and receptive skills and expressive skills. The intraverbal wasn't discussed much in in Lovaas earlier material; there examples of introvert behavior. But the whole notion that a single word, single response can both occur as a mand, a tact, and an intraverbal, the same word and the three are separate skills. Just because you can name something doesn't mean you can ask for it or talk about it. And so if I were to say what was the major contribution of verbal behavior, it's adding in the mand and the intraverbal relations as one element of what a verbal behavior approach might consist of. And that was basically what we did was we added all of those repertoires together.

Dr. Mark Sundberg: We also had a different teaching strategy. We all use discrete trial training in terms of formal instruction, but we also began to do more natural environment training. We begin to mix our trials for a variety of reasons and, and look at trying to make... A lot of this came from our speech pathology colleagues at the center was to make it more kid friendly, more typical, more fun, more enjoyable, more developmentally appropriate. And so trying to have a child with autism sit at a table for four, five, six hours a week was pretty difficult. But yet that was our school structure. Our kids came in and participated in 15 to 20 minute teaching sessions and they were basically able to respond for long, longer periods of time. But we also intersperse that with a lot of natural environment training, a lot of other kinds of activities and such. So our teaching format gradually differed a lot from Lovaas in the early seventies but again, in the early seventies that was before the 1977 behavior modification book Lovaas 77, Lovaas' 82 book. Neither one of those had come out at that time period.

Dr. Mark Sundberg: So the group of us that were doing that and in that time period all were kind of learning from each other in conferences, individual presentations and workshops. The differences between the two are now muddled in the sense that they've merged in many ways and it's harder to really say there's a huge difference depending on how you approach it. For example, if you go on Lovaas' website, you'll find in the center of one of his designs, what constitutes a Lovaas model is teach requesting as soon as possible. Well, there's our mand relation. Now Iwata and I had long and detailed discussions and arguments about incorporating the mand 40 years ago and he never liked verbal behavior and never wanted to do it.

But over time the whole notion of requesting and demanding was more valuable.

Dr. Mark Sundberg: Along the similar lines on that same chart on the Lovaas website, you'll find a strong emphasis on natural environment training. Well, many may not recall, but the Kegels were always harping to break away from the table, do more natural environment. So yeah, Bob Kegel, Laura Schreibman and others, Marjorie, Charlotte and others work extensively on developing the natural environment training model, incidental teaching and kind of making learning fun and less rigid in its structure. Yet we're still using basic behavior modification type procedures. So that model has shifted and such. And so really what we're looking at is behavior analysis that involves teaching procedures, much of which were developed by EVAR in terms of the basic skills. But instead of using expressive receptive as the framework, we're using the mand, tact, intraverbal listener discrimination framework to make sure all the different operants are established.

Mary Barbera: Thank you for that. And I agree that the Skinner's analysis bringing in... I had a behavior analyst once asked me, you know, it was like a cocktail party poster session and he's like, well don't you just think some kids are like discrete trial kids and some kids are VB approach kids? And I looked at him, I'm like, no. Like why would adding BF Skinner's analysis of verbal behavior never be a good idea? Like that is always a good idea. So I am with you and I do actually want to add something, and get your take on it. But I do think that now the difference between, you know, using kind of my approach from all of this information that I've gathered over the past two decades as a registered nurse, as an autism mom, as a mom of a typical son, as a behavior analyst, as an author, is I think what's missing in a lot of ABA programs that aren't utilizing the BF Skinner's approach enough is lack of attention to multiple control and lack of attention to transfer trials and errorless teaching, and kind of blaming the student for lack of progress.

Mary Barbera: I see that as being really critical and I want to bring up this...I just actually did a podcast. It'll be podcast number 51, and it's on the five areas where parents and professionals get stuck. So we've talked about a couple of them already. So the number one area is taking kids from non-vocal to vocal, getting them talking or getting them saying sounds or getting echoic control like that area where kids get stuck and the number two area is receptive, receptive ID. That's like understanding touch your body parts, or touch the banana and a field of three. And I've seen young kids stuck with receptive, I've seen 16 year olds with no receptive language. It's like how do you get to be 16 years old and no receptive language?

And I remember way back with the verbal behavior project, which is where I first met you, where you know I was the lead behavior analyst from 2003 to 2010, you were like a consultant for the project.

Mary Barbera: I remember you coming in and we did case studies one afternoon and so we presented this kid, I think he was about eight or 10 years of age. He had just transferred into a classroom and we had videos of him and we showed them to you. And I remember he had like no receptive language to speak up. He had PICA, he had all these issues, right. So I had the teacher at the time holding up two cards and she was saying touch ball and he was just touching either one. And, I mean you gave us a lot of advice on the whole picture too. But I remember specifically like having this major aha moment, it kind of changed the whole way I was programming for kids. But you said two things. You said, stop having them hold it up. She doesn't even have any, any hands to prompt him with, which totally makes sense, right? Like duh.

Mary Barbera: So we started putting a lot more things on the table. And then the second thing that you said, which was again just a huge aha, is in order to get receptive ID you really have to have strong matching and scanning. And the way you build scanning is through matching, not through receptive ID. And so a lot of my programs now in my online courses and the way I teach is to use multiple controls. So on the probe sheet it might be touch head with an imitative prompt, and then use a transfer trial to try to shape that down and get rid of that prompt. But so just in general, like you have given me really great advice on, you know, do you have anything to add in terms of your procedures for really getting matching strong in that case? Also getting imitation strong for the body parts and commands and matching strong for the receptive ID, I think is just huge.

Dr. Mark Sundberg: Well maybe, let's talk for a minute about multiple control and tie that in and see how that connects to all of this. Multiple control basically involves where two or more might control a response. So we're all, we're all familiar with using an echoic prompt. That is, I hold up a pen and say pen. And now there we would say, I've got a vocal SD and a visual SD. I might also have a motivating operation at strength that is the child wants the pen to write something or if I something a little bit more fun. So it maybe that those three sources of control get the child to respond, what they can respond under the circumstances of seeing the item, wanting the item and hearing the word. That may be easy. It allows you to evoke that.

Dr. Mark Sundberg: So I got a response now that I can do something with, I can reinforce it. Now my task is to transfer control as you had mentioned. That is usually,

it's the echoic in that example that gives away what the child should say. Say pen. And I know that if I just hold up the pen, I don't get anything, even though they might want it and try and grab it. It's the echoic is the primary source of control, but yet these are secondary sources. My task is to make this that primary SD, so that means I've got to transfer control from a coworker to the tact into the object. So that whole concept of transfer STEMI control is really the core of what we do hands on with kids. We're giving them lots of prompts so they're successful. But the key is to fade out the prompt. And as that applied to the listener discrimination procedure as you had suggested, you know, listener tacts.

Dr. Mark Sundberg: When I say touch pen, as you had mentioned, what the individual needs to do is scan the array and then emit some kind of response indicating the pen. But the tricky part is that the source of control is a spoken word. Pen, shoe, or car, and verbal STEM control is often very difficult to acquire over kids and that over kids verbal behavior. And that is obvious in for example, the intraverbal relation. It's hard to get kids to respond to an animal that he likes to swim. There's a lot of parts to words and it's hard for kids often to learn to take those words and, and have some correspondence with the physical environment. That is what you say goes along with what I'm looking at or what I'm seeing. So the procedure you described was simply establishing a skill. If we look at matching the sample and if I show you, if I show you a pen and I want you to match one of these, a lot of kids can easily do that.

Dr. Mark Sundberg: That's often not very hard to do is establish that under the control of this pen. I can now match it to this pen. That is I can scan an array and I can select that's the exact behavior that we're after in a listener discrimination that is touch pen, the child touches pen. The only difference is I got a second stimulus presence, there's our multiple control. So now I say pen when I'm showing the pen and in a sense all the child's still doing is matching the sample. They're just identifying a matching frame of my task is to get rid of this pen and transfer STEMI control to touch pen and there are a variety of procedure ways to do that. We begin to call that the blank card procedure because we'd have, for example, if this had a picture of a pen on it, I would use that as a prompt, it's find pen and the child would match the sample.

Dr. Mark Sundberg: Then we'd gradually put our hand over it or do it quickly, find pen, find pen, and pretty soon transfer control from the picture to the word. And that's all the procedure was, was if you're able to do it with a visual stimulus, now I've got to teach you to do it with a verbal stimulus. And turns out that it wasn't so hard to do. So that was always fun then to see kids now get it correctly, even though they're looking at this blank card.

And what we ended up figuring out was the blank card was almost a prompt to scan the array when they saw the blank card. They looked for stuff. And then eventually faded out the blank part. So it's those little procedures, but it's that kind of detail I think that gets us through true barriers that kids struggle with often for years.

Mary Barbera: Yeah. And... I think a lot of well-meaning professionals who are running ABA programs, whether you want to call it VB or not or whatever you were going to call it, if you're missing the analysis of multiple control and transfer procedures, I think that's a lot of the crux of the issues. I know Rick Kubina and I published in 2005 a study which we can link in the show notes here using transfer procedures to teach tacts for a child with autism. It was, Lucas was in the study and he helped me. Rick Kubina was my mentor and I did a podcast episode with Rick. I think we talked about that study more in-depth. But up until that point, like your teaching language book really recommended a lot of echoic to tech trials.

Mary Barbera: But for Lucas, because I think of his, his strong Lovaas ABA background where receptive was just like gold, right. Was just taught his receptive on his Ables at the time cause there was no VB-MAPP at that point. His receptive column was a lot higher than his tact. And what I found with his particular profile is if I gave it to him in a receptive to tact format, it was almost like multiple choice. And then, you know, based on that study, there were a lot more studies that were done after that. And so I'm constantly within my procedures, within my online, I'm constantly like multiple control, multiple control, you know, like blasting the matching, blasting the imitation and it, and blasting the multiple controls. So instead of match, you're saying pen as they're matching and you're transferring it right away and we're just having a ton of success. So thank you for that explanation and thank you for all of what you've taught me over the years. I feel like when I'm in your presence, you like have so much knowledge, so it's just awesome.

Dr. Mark Sundberg: Thank you. Thank you. And you've been great to take the content and teach others how to use it, which is really critical.

Mary Barbera: Yeah.

Dr. Mark Sundberg: Another piece to the multiple control, if I can. Multiple control is our friend and so we need it in the early stages to evoke behavior. And then as you had said, we've got to get rid of those other sources of control. So it sets us up for that nice teaching procedure, but as language becomes more complex, multiple control is mandatory in many verbal relations and you don't want to get rid of those other sources of control. In fact,

you can't. And let me give you the example of if I were to say something like what shape is this? What color is this? I say what shape? The word shape is a verbal stimulus. The actual shape of the item is a nonverbal stimulus. In order to respond correctly, both sources of control have to be operative. That is, I have to hear the word shape and respond to the verbal stimulus because that word changes. This establishes this as the SD rather than the color. If I say what color this is now an S Delta and the color is now an SD, that effect where both verbal and nonverbal stimuli interact is an example of multiple control. And as you get into more complex language involving nouns, verbs, adjectives, prepositions, conversations, and so on, those multiple sources of control are going to be required in order to respond. And that's where things get pretty complicated at that level.

Mary Barbera: Things get complicated very early on. And I do think that that's some of the issues is it is very complex and I see different ABA providers while we do teach manding we do, you know, we do teach intraverbals, but it's like this whole analysis of the multiple control and transfer trials and making sure kids are making progress and not just keep sticking with the same programs with lack of progress I think is detrimental for kids. So. All right. So you have some exciting work you're currently doing on generative learning. So can you tell us about that?

Dr. Mark Sundberg: Sure. You know, in typical language development some amazing things happen between about two and three years of life. That is typically developing kids language generally explodes during that time frame. So a child might go from a hundred words speaking vocabulary at two to a thousand words speaking vocabulary at three. Acquire skills in one trial. Reinforcements not required, behaviors acquired without adults interacting with a child. Part of our issue is that so many kids with autism never make that leap. So we have, we have profile after profile decades and decades where kids would get stuck at kind of mid-level to range on the VB-MAPP. That is they would acquire mands, tacts, intraverbals, and echoic imitative skills and so on. But they had a rough time breaking through this generative ceiling where language takes care of themselves.

Dr. Mark Sundberg: Language really in a sense, kids learn language on their own in many ways. And what we're after is how does that happen? And when it doesn't happen what kind of things need to be done? And so if we look at what are we talking about when we say generative learning and we're talking about their particular repertoires that once they're acquired, they accelerate or enable other repertoires that is prior learning affects later learning. If you have a certain set of skills, you now can do some more advanced kind of thing often without reinforcement, without direct

training. Take reading, for example, once a child is acquired a reading repertoire, once they have that skill, they can acquire new information through reading as they can learn stories, they can learn recipes, any kind of a thing that's appropriate for their level instructions and so on that are written if that repertoire is established, then learning can occur again without any further adult training.

Dr. Mark Sundberg: Once I can read, I'm on my own. At a simpler earlier level, if a child... This is not necessarily genital, but it kind of gives you an idea of what we're talking about. Once a child learns to crawl, for example, and it may take thousands of learning trials to get to the point of being able to crawl once they can crawl, that repertoire opens the door to all kinds of new contingencies than any parent knows. Once their child moves off, that blanket world has changed because now there's different things in that other room. I can now crawl to other reinforcers, pick up items and grab things. What was new contingencies, shape behavior on their own and as the parent no longer needs to provide every SD, every reinforcement of retrieval.

Dr. Mark Sundberg: Now if you think again of a lot of our early work with children with autism, we're often teaching every single response in the child's repertoire early on or establishing those. We have history, data collection and so on. We need to get the child to the point to where they begin to learn on their own. And so that as an overall goal is pretty critical. Don Bear's concept of behavioral cusps provides us with a direction in this area and it also kind of organizes the subject matter a little bit. And the way he talks about a behavioral cross is a behavior change that brings the child into contact with new contingency, new reinforcers, new stimulate and those contingencies in turn, shape and develop new behaviors. And that's examples of reading, crawling. Once a child has learned a pincer grasp, now they can pick up things they couldn't do before in that picking up things now shapes new behaviors. So there's kind of again, arrangements where an adult is not required anymore. Once I can walk I now have access to new things there that are going to shape behavior.

Dr. Mark Sundberg: Once you have an imitative repertoire, which is usually the hallmark of some of the generative learning stuff, once you have a generative imitative repertoire, I can now acquire new behavior with no formal training. I can do something correct on this first trial with no reinforcement. And that's sort of been the golden age in many respects. Or I look at it and say that that's where we want to head for children with autism is to wear new behaviors are acquired. But here's the trick, is that it only works if you have a certain set of prerequisite repertoire; that is you have to have an a echoic repertoire and imitative repertoire, tacts

repertoire and so on before you can move into an advanced stage. You know, on the VB-MAPP I've identified about 30 different generative learning repertoires and those generative learning repertoires are often very difficult to achieve and yet they're extremely powerful. I'll give you some examples of some level one things, so you kind of see how these fit in.

Mary Barbera: Hold on one second. So you're saying all the milestones within the VB-MAPP, you would consider generative learning repertoires that are important? Is that what you're saying?

Dr. Mark Sundberg: No, not at all. No, no, no, no. About 30.

Mary Barbera: 30. Okay.

Dr. Mark Sundberg: And I can eventually attach a PowerPoint maybe where people can look at that. And that's some of the in fact that the Penn State conference, national autism conference, is that a video archive of that where I lay out those 30 or 32 and talk about them.

Mary Barbera: Okay. We can, we can definitely attach that then.

Dr. Mark Sundberg: Okay. So at level one, if we look at what skill, if we look at the definition that we're talking about is using Bear's definition of a behavioral costs where one set of skills enables or accelerates another set of skills and it brings an individual into new contingencies with no reinforcement. That's kind of what we're operating on the VB-MAPP. There's three milestones that meet that criteria. One is mandates. So if we look at our early intervention, we've known for a long time, certainly that manding is really important, but it's also important because it's generative. So man, milestone five and level ones is with child can mand for 10 items. Well, once that manded repertoire is at that level, once it's established, it takes off on its own. In many ways that is if I can mand, I can now get access to something new that will shape new behavior.

Dr. Mark Sundberg: Also, the mand repertoire as we know is often one of the best ways to eliminate negative behavior and behavior problems to work on. Functional communication training is empirical demonstrated that the mand can replace problem behaviors. Well, there's a huge behavioral cost in the sense that if you can eliminate or reduce a child's behavior problems simply through talking through mandates, that opens the door to new contingencies and new opportunities. And so that's a big one that we always focused on. Another one in the mand in the level one is babbling; automatic reinforcement when speech sounds are reinforcing.

When a child likes to hear their own voice, when they respond because speech sounds are conditioned reinforcers. That's also another powerful behavioral cost that changes the way a child can learn. And the third one in level one is in the social milestones. Milestone five is where a child will react in an unprompted manner, follow a peer or respond to a peer's SD.

Dr. Mark Sundberg: And the significance of that is a peer has stimulus control over a child's behavior. And we look again at many children with autism and that's one of our biggest issues is that peers don't demonstrate stimulus control. A child doesn't attend to or a misbehavior controlled by another child's behavior. If we can get that, and we should get that at level one, that is an 18 month old child begins to imitate another child. And just in terms of say, following them around. So those kinds of skills become more significant than the other 42 skills. Now, those other 42 skills are certainly important, but what we're after is, is those particular skills. When you get into level two, all those generative repertoires are all along the top of miles of number 10, the top of the second level, all the number 10 milestones are all generative milestones.

Dr. Mark Sundberg: Those are all general general skills that once they're acquired are going to the child to learn new skills. For example, milestones in the tact repertoire in the listener repertoire. We look at both milestones, nine and 10 on the tact and the listener milestones. Nine or once a child can tact noun verb combinations and receptively respond to noun verb combinations. That's indicative of what we'd often talk about as we combine of generalization. That is I can teach a set of verbs and I can throw in any noun and you now can give me a noun verb response on the very first trial. Or I can, I can do the opposite. I can teach the noun and put it into a new verb. Well, that's Howard Goldstein's work and that's one of the many, many different types of generative learning. So that milestone again is, it's a little harder to achieve for a child than other milestones. But once you got it, if I can get the child to the point to where they can put in a new noun on any verb, boom, they're off with that repertoire. I'll pause there to see if you want to...

Mary Barbera: Yeah, no, I think this is, this is great. And I think part of the problem I see parents and professionals struggling with is, you know, the overuse of teaching carrier phrases, the overuse of teaching rote responding and not having milestones in the level one area of milestones and level two up to nine fixed. So it's like you are just, people are building a base on a building on top of a very unstable base and making weird language and so like as you're talking, I'm like, that's why my emphasis is so much on getting to the kids when they're first showing signs of autism; when they're first diagnosed; and trying not to mess up their language or teach

too high, which is always happening. And trying to let things use multiple control, let kids build language, don't over teach things like intraverbals, don't overt, you know, go step by step.

Mary Barbera: And, so this leads actually... Let's go to the next question, which I think really is an important one. You know, I've heard even really good behavior analysts that are friends of mine saying that the VB-MAPP isn't developmentally sequenced, which I know it is. I know your work in making it developmentally sequenced and kind of like, I know the Ables was not as developmentally sequenced as either of us would have liked, but... or the VB-MAPP isn't good for kids over five because it's only good for, you know, language, age of up to four or five.

Mary Barbera: And it's like this important work whether or not we're actually filling out the VB-MAPP for a teenager. This is important work to show that you can't just skip ahead and get a kid conversational. It's just not going to be like waving your magic wand and some of the things that I did over the years, you know, kind of didn't help Lucas get unstuck. And so now I want to help people prevent that. And so I guess maybe just respond to your work and I know because I helped field test the VB-MAPP back in 2006; I know the developmental checklists and the sequencing and the rigor that was involved with creating the VB-MAPP. So can you just tell us really briefly about that and then whether there's research based on it and all that?

Dr. Mark Sundberg: Sure. Yeah. The whole development aspect, like you're talking about the intraverbal in general is that, you know, we ran the VB-MAPP on a number of typically developing kids and basically looking for, on average, what's a typically developing 18 month old child talk about? What can they do, what can't they do using developmental charts. I was teaching a child development class, we had child development labs, we had, you know, groups of 10 year olds or a 10 typically developing one and two and three year olds. And so just to try and find out what are they talking about, what can, can they do adjectives, nouns, verbs? No, no they can't. Do they do contractions? No they don't. I mean, so you beginning to sort out what repertoires do we have naturally occurring and what ones do not occur.

Dr. Mark Sundberg: The intraverbal arrangement that we had was basically that 80 questionnaire, 80 types of intraverbals that we gave to a range of kids. And found that that there was a clear pattern in the types of questions that a two year old could answer versus a three year old versus a four year old. Once you got up to questions that don't ask you things like what can fly in the water and walks on land, or what do you eat that's hot?

Once your question had two or three parts to it, typically developing kids couldn't answer that. So we sequence things in that kind of manner. But the outcome of this is pretty critical. Or if we look at why would you do that? You brought up the intraverbal relation again and if we look at how is it that you get to generative intraverbal behavior, how do you get to where you see new things under new subject matter where people ask you a question, you say something different, it's not rote, it's a novel response. It's combined and suggesting that the repertoire is composed of earlier you have to have some prior learning. You already have to know some things before you can talk about it.

Dr. Mark Sundberg: And that's where one of the things that we often focused on is that in order to talk about things in their absence, it is tell me some animals that fly. In order to answer that, you have to be able to talk about them in their presence. At least for our children with autism, I'm not sure that the child needs to be able to, in that example, check flying. They need to be able to, as a listener, know what flying consists of. They need to be able to tag categories of birds and airplanes and other things that can fly. They need to be able to do them as a listener, in listener responding by feature function classes, touch something that flies touch, something that flows, something that swims and so on.

Dr. Mark Sundberg: So if you can't accurately talk about them, if you don't have the foundational skills, the probability of getting a rote intraverbal is very high. You can still learn that intervertebral repertoire, what flies in the air and a kid will say airplane, but yet if they don't understand fly as a verb, you got a rote response. And in that 2011 study which laid out the 80 item intraverbal assessment, we were seeing pieces of that. And again we proposed in that paper that in order to get emerging intraverbal behavior, you had to have four repertoires. Those four repertoires, you had to have the tact and listener skills of the nouns and verbs and you had to have the listener skills and tacts of the categories of animals, let's say, and vehicles in that if you can identify the categories that is animals and flying and so on, you can then put all those repertoires together.

Dr. Mark Sundberg: Wayne Fisher and his colleagues just recently published a paper in Java 2019 January issue where they tested that, and they tested again, those, the, the intraverbal relations. And they looked at those four skills. They taught the tact of the item, the listener or the item, the tact of the category, the listener, the category. And basically what the results showed was that once all four repertoires were established on the very first trial, they got immediate emergent, novel, intraverbal behavior. It is the kids were now able to correctly respond to the questions once they had all four, if they only had three of these skills, they didn't respond

correctly. It wasn't until all four prerequisite elements of the verbal repertoire were established that we are now able to get emerging intraverbal behavior. There's our generative repertoire and that's exactly what we're talking about. So then we go back and we say to teachers and families, establish these foundational repertoires in a solid manner. Make sure that they're truly a generalized repertoire of categorical testing. And when you have that your probability of getting to emerging relations is much higher.

Mary Barbera: Yeah, and I feel like your work with the intraverbal subtest, which we can link in the show notes, is really super important. I have within my online verbal behavior bundle, I have a whole, I have 25 bonus videos and one of the bonus videos is teaching intraverbal skills. And you know, within all of my courses and bonus videos are me working with kids. Thousands of videos of me demonstrating. But you know, I see this a lot too where second graders having problem behaviors, they are supposedly conversational or at least talking, and then they're not doing well, you know, they're going to get kicked out of general education or something. And I suggest do the group seven and eight of the intervertebral subtest because you know, labeling a kid is just a problem behavior like nine times out of 10 in my experience there's a language comprehension intraverbal issue and it's a language problem instead of a behavioral problem or an academic problem.

Mary Barbera: And so I really encourage people to do that assessment; the interval subtest even if they're not going to use the whole VB-MAPP, just to see if you need to do a VB-MAPP. Because I think there is a lot of confusion of just like, passing kids through and they're fine and really they're not fine. And there's a lot of holes and I see a lot of holes with kids too, with autism unfortunately. Okay.

Mary Barbera: So let's switch gears a teeny bit because I wanna wrap up as, you know, in the next couple of minutes. But before we do that, there are some questions that I'm getting a lot, you know... my child's gonna go to kindergarten next year or should my child be going to, you know, regular education school or autism ABA school, or should I do home ABA? Should I do school ABA? And you've done a lot of work with the transition assessments. So the VB-MAPP, for those of you that aren't familiar is the milestones, the barriers, and the transition assessment. All three parts are really important, especially for kids who are going to potentially go to group instruction or learning. So can we talk about self-care and group learning and the transition assessment, and why you think it's so important?

Dr. Mark Sundberg: Sure. The transition assessment was basically a result of spending a pretty fair amount of time and transitional IEPs, and IEPs were the child received their services as an issue, what kind of educational setting. And so basically coming up with a buddy with 18 different skillsets that simply gave parents and teachers some data to base the decisions on... for those who have spent time in those kinds of meetings, often children were placed in settings that were totally inappropriate. That is, we have kids that would be on level one of the VB-MAPP and be placed in a first grade classroom for particular reasons and I would look at that. And so it's a highly restrictive environment. This child can't access the curriculum of a first grade classroom. There are some social things and maybe other reasons to do that.

Dr. Mark Sundberg: The other direction would occur too, where we would have situations where a child would be in level three of the VB-MAPP have some very extensive verbal skills, but the child would be placed in a very intensive discreet trial EBA type program. And you know, we're looking at both arrangements and saying, well both of those are the most restrictive setting. Then if you've got a child that's level three on the VB-MAPP, you don't need one-on-one intensive. No 30 hour a week, behavioral intervention that may not be the most, the least restrictive. So these 18 items basically looked at the individual child simply to give the parents and the teachers some data, some information to base their decisions on what educational setting, what teaching arrangement would produce the best type of learning on the child's part. So if you look at that's what we're interested in is what environment does the child learn best?

Dr. Mark Sundberg: And they're often all kinds of other reasons to place a child here or there. What we want to know is where does the child get the most gain out of? And so there's a collection of things to look at. And for example, one of them was just what level is the child in the VB-MAPP? So if you start out with a level one child versus a level three child, a level one child still needs intensive behavioral intervention, they still need staff that can prompt page, shape, intensive data collection, highly specialized staff. And those staff typically aren't available in a regular ed classroom or a less restrictive setting. So if you're going to put a child in that environment, it's clearly going to affect their learning. They will not learn as well if they're in a setting that doesn't use a task analysis and so on.

Dr. Mark Sundberg: A child on level three on the other hand is less susceptible to kind of sloppy behavior mod. That is, you don't have to take data on every trial. You don't have to reinforce it. You've got a kid that's that that can handle is on a good extinction schedule, can raise his hand 15 times before he gets called on, but hang in there. Whereas a level one child or a level two

child may not. So as you look at that level, that tells you something. If you look at other skills like for example, one of the 18 is the reinforcement schedule. If you've got a child that has to be reinforced on every trial, every five trials, every 10 trials, that's not going to happen in a less restrictive setting. You're not going to get that rich schedules or reinforcement. There's not going to be any edibles or tangibles. There won't be those kind of things that we see in an ABA type classroom versus a first grade classroom

Mary Barbera: Or, just, and I see this a lot too, is oh well he'll have a one-to-one. They agreed to a one-to-one. This is an untrained one-to-one who is not going to know what behaviors to reinforce, whether it's a level one or two child. That worries me too is, is you know, just because the funding is such that everybody goes to regular ed and you can fight for a one to one... If you don't have a behavior analyst who cannot just train but guide and provide ongoing consultation, that's really not a great situation.

Dr. Mark Sundberg: No. And you know, for some kids that may work fine and other arrangements and such. But what if we look again at the teaching format and the level of the child that access the curriculum, access what's being taught. Now the child has all those prerequisites. For example, if we're doing intraverbal work in a classroom, if I have those four repertoires already, maybe I can figure out what's being talked about. But if I don't have those four repertoires. I don't have a clue as to what the teacher's talking about. And I have a one to one but the one to one person can't help me in that setting with what I need to be able to access the intraverbal content.

Mary Barbera: And what I've found for kids that are at level three, you know, they still have some holes and they're in first grade say, they might be able to be included without one-to-one support, but they are still in need, especially if they're first grade, then they're, you know, functioning at a four year old level pretty much. In my experience, they still need like pull out language for learning or language for thinking. They still need language work. And so I think that's another mistake I see is people go to kindergarten or first grade or whatever and it's like they're at a level three but who's going to catch up their language? And if you start just doing academics and the language isn't there, they'll fall apart.

Dr. Mark Sundberg: That's right. And if we go back to the generative learning content, one of the differences is your first graders loaded with generative repertoires. You only need to tell them things once that they can take what they know in and it's not generalized, they can now emerge new relations and B and C and D and E and all kinds of things are happening with that first

grader that are not happening with the four year old or the three year old and especially then add that child with autism who may be seven or eight but is scoring at the verbal repertoire three or four. If they don't have those generative repertoires, they're not going to have a clue. They're not going to be able to learn in the same manner as the first graders. First graders are going to be beyond them in the first week, second week, they're already way beyond.

Dr. Mark Sundberg: And the notion that now the kid's going to somehow catch up with first graders without any of those prerequisite repertory, she can't. And that's where part of the transition assessment is saying, let's look at the repertory that the child has and now see if they have the prerequisite repertoires. It's a benefit from this environment. If it's only minimal, there's all kinds of arrangements that we would do. You know, you just go in for math if you excel in math, you just go in for reading, avoid circle time at all costs, which is like everybody wants to do that for the first integration. And that's like the hardest thing in the world for a lot of our kids

Mary Barbera: Or calendar time. You know, calendar time with level one learners is like, what are we doing here? You know, it's a waste of time. And so, you know, it's just... Okay. So as we wrap up here, so what can we do? I mean, my online courses cover all of this. Like I have an intermediate learner course that is very robust. It covers language for learning and covers, you know, reading, math, writing, self-care, showering, like all of this stuff, plus all the language. The, how do you form two word, you know, pivotal phrases and how do you prevent all this scripting and stemming and all this stuff. But how do we take the field and help our children and clients, you know, reach their fullest potential when we have all of this? I mean, this is you and you're trying to, you know, really make it accessible for both parents and professionals to listen to this, but it's like, how do we move forward?

Dr. Mark Sundberg: Well, education of the special ed teachers and speech language pathologists and parents has been kind of slow but steady as we seen gradual change. And I think what we've lacked certainly in the seventies and eighties was buyin from the educational institutions. That is kind of things that need to be done, require a lot of people, a lot of professionals. That is the people that are working with the child, have to have a set of skills that they're not gonna get in special ed classes. They're not going to get without behavioral education of one type or another. The development of the BCBA I think has been an important change in our field now that we have at least that professional level established

with RBTs as well. Increasingly school districts have been feeling pressure insurance companies have played a role in establishing the BCBA.

Dr. Mark Sundberg: We didn't have that 10 years ago, really. We didn't have it certainly in the seventies or eighties or nineties. So there weren't a lot of trained people out there. So we're getting more and more trained people. Our parents have certainly been the driving force behind this change that we've seen in the last probably 20 years or so when knowing that this all works, but it requires a special set of skills. And that's the hard part. I think that big change won't occur until behavior analysis is brought into special education curriculum. And that's a big request. I think we've seen it happen in speech pathology that we've seen huge blending of the fields of behavior analysis and speech pathology in part because we do the same and we're interested in the same things. I felt, again 15, 20 years ago when we started getting support from speech pathologists, it kind of legitimized all that much of what we were doing in the sense that we could say the child needs to request, they need to get out, they need language, it needs to be 24, seven it can't be 15 minutes, twice a week. It has to be intensive.

Dr. Mark Sundberg: And then to have the speech pathologist community come in and say, yes, we can't do this by ourselves. We need parents and teachers. We need everybody on board to do this. Change is gradual. But you know, I got to say, back in the 70s we thought this would all be figured out by 1980 by 81 everybody would behave, be behavioral and all school districts would jump on board because it works. The fact that we're 35, 40 years later and we're just kind of saying the same thing may sound discouraging, but yet I look at the progression in my professional lifetime and it's been massive. The change between just the nineties and now the eighties and the nineties are much more parent friendly, professional friendly, and a much better environment now to make progress. Certainly more understanding of both autism children behavior analysis. And that makes it all, I think positive in that sense. Now what we need to do is get the content out there more and that's where what you're doing is very valuable. Research is very valuable. The how to, being able to go to some sites, some access point and be able to get information I think is really important.

Mary Barbera: Yeah. I have people, parents and professionals from over 65 countries who have purchased one or more of my courses. And I have members, some of them have been with me since 2015 when I started online. I provide continuing education for behavior analysts. So it is exciting and I owe a lot to you to mentored me and to have taught me so much and it's been a real privilege to get to know you over the past 15 years or so. And

I agree. I think, I think we're, we're right at the cusp where this is getting in the hands of parents and professionals and grandparents and early intervention professionals and they're seeing it works and they're seeing that the change, whatever change they make works and that's super exciting and motivating, and so it's gonna build momentum. So I'm really excited.

Mary Barbera: So part of my podcast goals are for parents and professionals to be less stressed and lead happier lives. Do you have any tips for in that realm?

Dr. Mark Sundberg: Well, I think there are two separate issues; parents and professionals and as a professional, we don't come anywhere near the degree of stress that a parent has. That is, we get to go home. We're done at the end of the day, the parent is 24/7 and the issues are so very different. And I think that if we go back to the point about you're early intervention and the point about the material you're doing and others are doing in that area, I think one of the best reducers of stress is to have the right answers to know what to do. That is a behavior problem can be incredibly stressful in the store and, and public and or any situation. And it results in embarrassment and it results in avoidance of some emotional issues highly complicated for a parent to know what to do and to deal with it.

Dr. Mark Sundberg: If you've got the right tools, if you know the variables that evoke a tantrum or you know how to deal with the tantrum when it has it, when it happens, those are the tools that are going to reduce your stress, that you're able to eliminate averse. You're able to avoid a versus. In addition, having those same tools that allow you to teach the adaptive skills or teach the language and academic skills and to see that happen. And it goes back to the early intervention importance. If you bring a parent on board early to teach them about how behaviors acquired, what do you reinforce, how much, you know, ignoring behaviors. Okay, that and here's when you do it. I mean once you've got those basic behavioral concepts, if you can empower a parent with those concepts at one and a half and two, they're going to avoid a lot of the problems they're going to get for five, six, eight typical developmental problems and so you get them going at the terrible twos to say, you're going to get a tantrum. Here's what a tantrum is about. Here's how you deal with that.

Dr. Mark Sundberg: That repertoire I think is probably one of the most powerful skill sets you can impart to appear in early on because then they now know what's going on with their child who, and then they go into the school districts at three or whenever services are going to be available and they, they know what's what's good and bad. They know what works and what doesn't work. And they know if you have my child sit there and draw for an hour,

he's going to be beating somebody up. You got to have active engagement. He's got to be, you know, he's acquiring a word a day and at home he should be acquiring at least a word, a day in school. And you know, so I think again, knowledge is powerful and if you can impart the knowledge I think it will avoid problems down the road.

Mary Barbera: Yes, totally agree. So how can people follow your work? I know you have some exciting things coming up in the next months and years ahead.

Dr. Mark Sundberg: We just launched a new website, actually. We launched two new websites. Marksundberg.com has got its first major let's say overhaul in 12 years since I originally put it out there. So there's new pictures maybe with a beard, I'm not sure. But in that website, what I've provided is there's one link to all my available publications. So there's about 50 papers that, that people can download. They can download the intraverbal assessment and that kind of content. There's also about 35 or so PowerPoints across a variety of topics. And I tried to get a power point on each one of the major topics like mand training, tact training, intraverbal automatic reinforcement, multiple control, the audit clinic. So if people want the PowerPoint content, and again you only get so much out of PowerPoint, yet those are all there.

Dr. Mark Sundberg: And then I've linked them to those that are, there's a written paper that corresponds to that particular powerpoint. They're not all written up, but many of them are so that you can get the written content as well as the PowerPoint. So there's, that's probably the best access to my written and spoken work that's out there. And there's a few other on historical things I've attributed to Jack Michael on the website, which has some photos and links to Jack Michael's work and some of his contributions. There's links to other resources, like your book, your material other professionals work on there. There's a lot of free downloads of worksheets, picture sheets and so on.

Mary Barbera: Thank you from professionals and parents that are listening. I want to thank you for being so generous with your knowledge, with your information, you have really, you know, changed, I know you've changed my life and changed Lucas's life and I know you've changed everyone's life that are in my courses and everything. So thank you from the bottom of my heart. I just got a book deal to publish another book in April of 2021. And I was telling Mark about it before we hit record, but I'm super excited about it. It is for parents, grandparents, early intervention professionals, but anybody that wants to help kids showing signs of autism or newly diagnosed to take action, to not wait in line for a diagnosis or wait in line for treatment to know what treatment you need

and to really empower parents to become the captain of the ship to really help their kids change the whole trajectory of their lives and super excited.

Mary Barbera: So thanks again for your time. If you enjoyed this episode you know, share it with everyone and the more eyes and ears we can get on the podcast, the better we can spread the word. So share it. Give me a five star rating and review for the podcast and that'll help me spread the word even more. Let me know if there's another episode that you'd like me to do or I'm sure I would love to have Dr. Sundberg on again. So I'm sure we could go on literally for days and days and keep interviewing you, but I want to respect your time and respect the listeners time. But thank you so much. It's been a great interview.

Dr. Mark Sundberg: Thank you, Mary, for doing this.

*Thanks for listening to the Turn Autism Around podcast with Dr. Mary Barbera. For more information, visit [Marybarbera.com](http://Marybarbera.com).*