

Caregiver Interventions to Enrich the Early Language Environments for Children Living in Poverty

Front Porch Series Broadcast Calls

Gail Joseph: Hello, and welcome to another episode of the Front Porch Series. I'm Gail Joseph, the co-director of the National Center on Quality Teaching and Learning. And on behalf of everyone at the National Center on Quality Teaching and Learning and the Office of Head Start, who generously funds us, we would like to welcome you to our session today, which is really going to be focused on early language and early language intervention.

We are delighted to tell you that today – it's kind of special because we're actually here on location at the University of Chicago Children's Hospital, and actually in person here with Dr. Dana Suskind and her research assistant, Kristin Leffel, who are going to take you through today's presentation that I think you're going to find extremely helpful and interesting about early intervention around language.

I want to tell you that you can always ask questions throughout our webinar today. You can post those questions in the question box, and should we have time at the end, we'll make sure to get those questions asked for you.

Again, the Front Porch Series is our time once a month to come together as a learning community to hear about innovative and very evidence-based interventions around quality teaching and learning. And so with that, I'm going to turn it over to Dr. Dana Suskind.

Dr. Dana Suskind: Thank you so much, Gail. The title of our talk today is "Caregiver Interventions to Enrich the Early Language Environments for Children Living in Poverty." I'd like to thank the National Center on Quality Teaching and Learning for giving us this opportunity to really share our – our research and experience with our new intervention.

So what are we going to review today? First, we're going to delve into, really, the disparities in early language environments – language development in children living in poverty and the impact that it has on their educational trajectories. We'll then go into the source of this disparity and really focus on a child's early language environment. We'll then discuss our approach to this gap – closing this gap, a novel parent-directed intervention we call the Thirty Million Words Project. During this time, we'll go into sort of our intervention development, how we implement our intervention, and some early results from our randomized control trial. And lastly, we'll finish up with the next steps for our program.

So, why do I start off with this slide? I think it's really an amazing visual that really demonstrates the tremendous impact that a child's economic circumstance has on his or her educational trajectory. What this slide shows is the early vocabulary development of children according to their socioeconomic status; and this is from the well-known Hart and Risley study. What you can see here are – the green line are children who are growing up in low-income backgrounds and the red line are children growing up in

more high SES backgrounds. And you can see, at the age of 16 months, children are pretty equal in their vocabulary development. But soon thereafter, their trajectories really diverge, and you can see that by the age of three, before they've even stepped into a Head Start classroom, the – their vocabulary development is very different, with children from high-income backgrounds knowing over 1,000 words and those from low-income backgrounds knowing half as many – approximately 500 words.

But as we know, early language development is so much more than just vocabulary, and the science has really shown us that these – these disparities in language development include language processing, comprehension, production. There have been demonstrations of disparities in children's grammar development, narrative skills, and phonologic awareness, which we know is so important for literacy development. Bottom line, these disparities in early language skills are seen not only from infancy but through high school, with the gap only widening with age.

So why do these early language disparities matter? Why are they so important? Studies have shown that language skills have a profound impact on a child's educational trajectory. Really, language skills are foundational for school readiness, literacy, a child's cognitive ability; and it is these early language disparities which play a critical role in the SES academic achievement gap that we see today.

So what are the source of these disparities? I'd like to emphasize that, as with everything in life, it is multi-factorial. But again, the science really points to a child's early language environment, meaning the amount and quality of language that children are exposed to in the first years of life, as a root cause of these early language disparities. Basically, how and how much parents talk to their children impact their language development greatly.

But – but the – the studies have really shown that children experience very different early language environments. It's what Hart and Risley termed "the 30 million word gap." And what they found in their landmark study is that children from higher or more affluent backgrounds heard approximately 45 million words by – by the age of three, whereas those from low-income backgrounds will have heard about 13 million words. This translates into a 30 million word gap, which they found profoundly impacted the children's vocabularies, test scores, and IQs.

But we know that – that a language environment is so much more than the quantity of talk, and disparities in early language environments have been shown also in the qualitative aspects with parents' language input differences in significantly less talk and gesture, shorter and less complex phrases, less use of open-ended questions, and greater uses of directives. Ultimately, inequity – inequities in early language environments contribute to the achievement gaps that we see today through children's language development.

So we asked, "What if we could develop a program to help parents enrich their children's early language environments?" And from this question bore out an intervention we call the Thirty Million Words Project. This is an eight-week parent-directed behavior intervention really to help parents enrich their children's early language environment. It's been developed for children under the age of three and is

implemented in a one-on-one home visiting model, and it combines not just the very important education but specific behavior-change strategies, as well as technology. And what underlies our – the TMW intervention are three important philosophical points.

First, that parents are children's first and most important teachers; and that enriching a child's early language environment occurs through promoting parent-child interactions, which have been linked to positive child outcomes; and lastly and importantly, enriching a child's early language environment does not require changing cultural practices and values or idiomatic speech.

From these – this philosophical foundation, we developed three goals for TMW: 1) to equip parents with the knowledge of their child's brain and language development; 2) to increase parents' belief that it is their words that has – that have the power to build their child's brain and to positively impact their educational outcomes; and 3), and importantly, to increase parents' language input to enrich their children's early language environment.

And with this, I'd like to turn over the talk to Kristin Leffel, who will talk both about the curriculum and the implementation of it.

Kristin Leffel: So from those goals, we developed our TMW curriculum, which is culturally sensitive and focused on increasing parents' language input and their parent-child interaction. So, this curriculum presents evidence-based information in an approachable and easy-to-understand, or what we call cognitively fluent, manner that's accessible to most literacy levels. And we developed this over a few years of extensive formative development and testing with lots of parents and community stakeholders and interdisciplinary experts; and the iterative approach is continuing today.

But as we know, bathing a child in lots of rich language takes more than just talk and lots of word input. There's lots of other elements that go into it, so we've worked hard to embed lots of strategies that make up a rich early language environment, which includes child-directed speech, turn taking and wait time, description and expansion, scaffolding and joint attention, routines, open-ended questions, labeling, praises and encouragements, prompting over directives and commands or prohibitions, dialogic book reading, and turning off the TV and other media. So, the TMW intervention has all these elements in it.

The coaching method is our overarching philosophical approach that we take. The educational modules are computer-based, and there are eight weeks of them, and we implement the curriculum through that. And we incorporate the behavioral strategies, such as video modeling and LENA quantitative linguistic feedback and goal setting, into them. So, the coaching method – we see parents as partners in it. And so, throughout the home visit, we just make it very discussion-based and motivational and take a non-judgmental approach. And through that, the parent – or the home visitor fosters parents' sense of autonomy and competency.

And so, the educational modules, they're eight weekly computer-based modules, and we integrate lots of practical strategies to increase parent talk and turn taking, and just parent-child interaction into routines and everyday activities. And we include animation and real parent video examples into these educational modules. So, unfortunately, over this platform we can't show you any video or animation, but we have taken some still shots of the animations just to give you a feel for what those are.

So, we talk to parents about growing their child's vocabulary through narration and rich descriptive language in just everyday routine activities. So instead of just making a sandwich, for instance, talk to your child about it. So we talk about – you know, talk about how you're doing it, how you're making the sandwich, and describing lots of colors or textures or smells or tastes. So, we say there's no limit to how much you can say about it.

And also, get your child talking to you. So, you can turn really mundane routine activities like taking the bus downtown into something fun. So, you can talk to your child about which way you're headed on the bus and how you know which way to go from reading the numbers on the sign and the words on the sign. And talk about how you're going to get there, and have her tell you what she sees out the window and what she thinks you'll do when you get downtown.

And we also talk about some of the softer skills that are important to rich language environment, such as tuning in, which is really having joint attention and talking about what your child is interested in and focused on at that moment. We also talk about dialogic book reading, or what we call book sharing, to really increase child engagement in books and foster a lot of parent-child interaction and build literacy skills that way.

So, one of the behavioral strategies that we use with the intervention is video modeling, where the home visitor and parent practice the new skills that they learned in that week's module on video and then they review the videotape and discuss what they did and what they saw using the coaching method. And we've found this to be an effective tool for increasing mindfulness and helping parents learn and master new strategies.

And really what we have at the core of the intervention is feedback. And for this, we use the LENA, which is the Language Environment Analysis System. So, the LENA is an innovative piece of technology that grants an unprecedented window into children's natural language environments. So the LENA is a little recording device that's smaller than a cell phone that children wear in the pocket of a specially made T-shirt. And the LENA goes wherever the child goes and records from 10-16 hours of the child's language environment that day, and it measures, among other things, adult words, conversational turns, the child's vocalizations, and then TV and media exposure.

And so, we use it as a tool to build the parents' awareness of their language input and give them feedback on that, and also to motivate them and then set goals with them. And so each week the parent gets a report from the – from the LENA recording they did that week, and so they can actually see how many words they're saying. And so, this is an example of one of those reports. This is one mom's report

on her sixth home visit. And so, we first show them just an average of how many words they said that day. And so, you can see the red line at the bottom is her starting point. So that is an average of her baseline recordings before she ever started the intervention. So, you can see that she has increased quite a bit above where she started out once she enrolled into the intervention.

But then we also like to show parents how much they're talking hour by hour so they can see throughout the day when they're talking the most. So you can see at 9 a.m. and 12 p.m. she was talking quite a bit, almost – over 3,000 words in just one hour alone at noon. So, that's great. But we also can't say for sure that her child was really benefiting from that because, you know, was she actually talking to him?

So what we want to look at, then, is conversational turns. And so turns, how that's defined, is if the mother says something and the child responds, or vice versa, counts as one turn. And so, again, you can see she's really high above her starting point from her baseline recordings before she started the intervention. So this is just an average turns per hour each day, and then again, looking at it hour by hour. So you can see, 9 a.m. she was taking a lot of turns, and then 4 p.m. she was taking a lot of turns again.

So this is showing us that there's a lot of interaction going on with her and her child. And so this is what we get the most excited about and encourage the most with parents, is that she's really engaging a lot with her child during these hours. And so, this is what we encourage a lot with the moms in the home visits. And then we also show them their TV time totals as well to try to encourage them to cut down as much on TV and media as possible.

And then after we show them their LENA results, we also do goal setting. So we set both quantitative and qualitative goals for the week to come, both for their LENA recording but also just for the week in general. And we choose specific routines and times of day to focus on to implement the new strategies that we'd been talking about that week. And then we discuss barriers to meeting those goals, and then strategies to overcome them as well.

And with that, I'd like to hand things back to Dr. Suskind to discuss the results from our pilot study.

Dr. Suskind: Thank you so much. So we're just wrapping up a randomized control trial of our intervention; some of the later data is still coming in, but basically the results look very promising. What do I mean by a randomized control trial? Basically, one group of mother-child dyads receive the TMW educational modules, whereas the control group receives a nutrition intervention, an intervention that has nothing to do with language. It's implemented in eight weekly home visits, and it was done primarily on the South Side of Chicago. Who are our participants? We had 40 mother-child pairs from low-income backgrounds with typically developing children between 1.5 and three years of age. The mothers were primarily African American because of our location on the South Side of Chicago.

This is just a snapshot of what it looks like to go through this study as a participant. And before the families even begin the intervention, they come in and we really look at their baseline language environments and who they are. They have two clinic meetings where we – where the mothers perform – we do literacy testing, IQ testing, basic demographic information is obtained, and they also do their three weekly LENA recordings. And this – these three recordings are really important because they provide the baseline of what these families' language environment looks like and what we'll be comparing to in the future. We also do baseline testing on the children, including the Bayley's and vocabulary development.

Then they – they begin the intervention part of the study. And again, if they're in the control group they receive a nutrition intervention, and in the experimental group, the TMW educational intervention. And they get eight weekly home visits and do a LENA recording between each home visit. After the – the eight weeks of the intervention trial, we then follow them up four months post-intervention to really see how much has stuck.

What I'd like to do is share with you the preliminary results. Again, the data's still coming in now. And the way I'd like to look at these results is through the lens of the goals that we discussed before. And as you may recall, our first goal was really to equip parents with knowledge of their child's brain and language development. And we used a 30-question survey looking into parents' knowledge of child language development, and examples of the questions included: "How many words – words three-year-olds know can predict how well they might do in kindergarten;" 2) "Talking about the differences between tall and short teaches toddlers about math."

And what did we find? Let me just walk you through the – the pre-/post-results of the knowledge questionnaire. So, you can see the dark blue in the control and treatment is the pre-intervention. This is where they started out. And when you – you can tell that the control pre-score is very similar to the treatment score, so they came in with very similar knowledge. And the light blue is post-intervention. And for some reason, it looked like, in our control group, that their knowledge score did go down a little bit, but basically the same.

But let's turn our attention to the treatment group. And again, in this – this score, the higher the score, the higher your knowledge of child language development. And you can see, post-intervention, the treatment group really increases their knowledge. The pre-/post-treatment effect is significant at the five percent level, meaning that it is – that these mothers appear to have gained more knowledge post-intervention from the TMW educational program.

Now, let's look at our second goal. Our second goal was really to increase parents' belief that it is their words that have the power to build their child's brain and to positively impact their educational outcomes. Now, there is no known questionnaire to look at this specifically, but what – what this question is really asking is, "Do parents believe that intelligence is malleable and can be increased with – with their input?" That's the real question.

So we used a questionnaire called the Theories of Intelligence Questionnaire, which really measures peoples' belief in intelligence. Do they believe it's static and you're either born smart or you're not, or do you believe it can be increased and that your words can help grow your baby's brain? And some of the examples of questions that – that are in this questionnaire are: "A person can learn new things but they can't really change their basic intelligence;" or, "Someone's reading ability is something about them that they can't change very much."

And so, what did we find here? I'd like to walk you through this – this Theories of Intelligence score. In this, as you increase your – your TOI score, that means you – that you believe more strongly that intelligence can be grown, that it's malleable. And that's really in line with the TMW philosophy, that it's words that help grow their babies' brains. On the other hand, the lower the score the less you agree with this and the more you believe that intelligence is something that you're born with. You're either smart or you're not.

And I'd like to walk you, again, through the control versus treatment. The dark blue, once again, is their pre-score; so this is what they believed before they started the program. And you can see that the – the pre control group score and the pre-treatment score are very – are pretty equal. So, both groups really believed equally in intelligence, had a similar view.

But let's look post-intervention. For some reason, in our control group, post-intervention they seem to go down in their incremental views of intelligence. They – they started believing more, and I'm not sure why, that intelligence is – you either have it or you don't. On the other hand, when you look at the treatment group, you can see post-intervention that their – their bar goes up. They're believing more strongly that – that intelligence is something that is malleable, it's something that can be increased. And this is statistically significant at the five percent level.

And I think this is a really important point, because in so many parent interventions, everybody talks about empowering parents – which we completely agree with – but what is empowering parents without taking into account their beliefs regarding intelligence and their child's intelligence? Because if you don't at baseline believe that intelligence is malleable and can be increased, empowerment is almost a road to nowhere. So, we felt very good that parents are – were believing more strongly that intelligence can be increased.

And let's – let's look at the last goal, that we – we hope to help increase parents' language input to increase their child's early language environment. And we're doing this through the lens of the LENA results. We're showing you up to week 11, and I'm going to walk you through the results. This – the first group that we're going to look at is changes in conversational turns. And I'll be frank with you, I think that, for me, conversational turns is the most critical outcome measure because it really demonstrates active engagement of the parent with the child. You know, it's one thing to talk, talk, talk, but it's a whole other thing to really engage and have conversations with your child, and so that's why I show it first.

And when you look at the graph – I'm a very visual person – the dark blue line is the treatment group and the light blue line is the control group, or the group that got the nutrition intervention. And as you may recall, the first three recordings are their baseline. It's before they received any educational input. And amazingly, the – the first three are pretty similar in their recordings. But then you see something dramatic. This is the line where the intervention begins. You see that parents in the experimental group really increased dramatically the number of conversations that they have with their child.

In contrast, you look at the – the control group, or the nutrition group, and you see that they're pretty stable. And I must admit, I was pretty surprised at how relatively stable the control group was, because I thought sort of, you know, parent language goes up and down, and I'm sure that it does, but I think this is a pretty visual – visual evidence that TMW does impact, at least in the short run, parent conversations with their child.

Next, let's look at the adult word count. You know, as you can – just at – glancing at this, you can see it's not as – as neat of a – of a graph, but I think it's still an important graph. Once again, the dark blue lines are the experimental group. The light blue are the control group. And they – they don't start off exactly the same, but I think the adult word count is very sensitive to the number of people in the room. But just focusing on the experimental group, you can see that their first three recordings are pretty – fairly stable. And then post-intervention, they really – they really increase significantly.

In contrast, there's a little bit more of a, you know, jagged saw appearance to the control group, which – which is likely related to the number of people in the room. And that's why I really think conversations are so key, because adult words are great, but it's not as meaningful if you're not engaging your child. So that – that's a little bit of our preliminary results.

I'd like to sort of talk about our next steps – our next steps from a curriculum development standpoint. We have learned a tremendous amount from this pilot, and we've decided that, because so many parents were asking about, sort of, executive function sort of aspects of their child's development, we – we are going to increase our TMW curriculum to a 12-week program and really embed ideas about executive function and how parent language can impact it. We're hoping to translate TMW into Spanish and other languages, because that's invariably one of the first questions we're asked, and we think it's incredibly important. And then, we're going to look into other methods to support sustained behavior change; you know, boost our home visit sessions, group sessions, to harness social capital.

There are – there's a whole lot of things that we'd like to do. But, you know, our real future next steps for TMW are to perform a longitudinal study focused on the long-term child outcomes. While it's all wonderful and fine and good to show changes in parent language behavior, the key is really showing changes in child outcomes, and we'd like to track these children and families through elementary school and beyond. But I'd like to stress that this is – that TMW isn't a silver bullet. It's really been – it's been developed to really be incorporated into more of a holistic wrap-around program, and that's how we'd like it to be implemented.

Our true ultimate goal, though, is that every parent really gains the understanding of the power of their words – the power of their words to impact their child's educational and life-course trajectory. Thank you very much.