NCHAM-Increased Paternal Linguistic Input to Children with Hearing Aids during the COVID-19 Pandemic - (Dual: Streamtext/ Adobe Direct)
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(Audio recording for this meeting has begun).

Well, good day, everyone. I like to welcome you to today's webinar entitled "increased paternal linguistic input to children with hearing aids during the COVID-19 pandemic.

My name is William Eiserman.

And I'm the Associate Director of the National Center for Hearing Assessment and Management at Utah State University, which serves as the EHDI national technical Resource Center funded by the Maternal and Child Health Bureau.

We're happy to have many webinars that address different areas of interest

and need.

And this is one of those.

I want to make sure that you all know this webinar is being recorded.

And it will be posted at our website at infanthearing.org.

Where you can find it and stream it in the next couple of days.

So if anything disrupts your full participation today, please know that you can go to our website and view it again there.

And keep in mind in case there are others you know who think might benefit from today's webinar.

That they also could go there to stream it at another time.

As we proceed, do not select the full screen mode.

As that will actually reduce some of what you see from today's presentation.

That may sound kind of counterintuitive, but we just encourage you do not select full screen mode.

And if you need to step away, you can just do that without using the function telling us that you're stepping away.

By telling us that actually just doesn't disrupt the flow of our presenter's remarks. Also if you need closed-captioning, you will notice at the top of your screen a CC button.

CC icon.

If you click on that, it will open up a closed-captioning box beneath the slides.

You can then expand or reduce in size, and position to your liking.

I want to make sure that everybody knows that we appreciate the skills it talents of our closed-captioner today. That's a real live person who is doing our captioning.

So we always want to make sure they know how much we appreciate their availability to us.

And closed-captioners are not very plentiful.

So we're really appreciative we have the services to help make our webinars as accessible as possible.

So thank you to for your services today.

So I think without -- oh. Couple of other things.

Once our presenters have wrapped up their comments today, we're going to open up the floor for a flow of conversation where you can raise questions through a text field.

And you can hear our presenters or her colleagues respond to those questions.

We'll also have a chat box available during the screen during the webinar, so if there are particular questions you need to address during the webinar, our presenters and colleagues will be able to address those as we move through today's presentation.

So I think without further delay, we will pass the make phone over to Molly Cooke from Ohio State University Medical Center.

>> Thank you, Will.

And thank you, everyone.

For making the time to join us today.

And especially thank you to, Cindy, who is doing the captions.

>> My name is Molly Cooke, and I'm a clinical research coordinator in the department of otolaryngology in the Ohio State University.

And I work in interdisciplinary lab that looks at, we have several studies that all approach questions related to people with cochlear implants and hearing aids.

And how they develop, particularly the studies I'm involved in related to children.

And my co-presenters today and mentors are Dr. Carrie Davenport and Derek Hughes son.

So big thanks to them for supporting me in doing this. Today I'm going to

talk about my project.

Increased input to children aid during the pandemic. This is a project I prepared for presentation as a poster at the EHDI 2021 Conference.

So thank you to those who attended and saw the poster and linked it. They liked it so much I got invited to do a webinar. I'm excited about that.

So let's get going.

So little bit of background in talking about language acquisition as it is.

As it applies to children who are deaf and hard-of-hearing.

There is considerable availability in this population.

And oftentimes delayed in language outcomes for these children.

And one of the studies in our lab specifically looks at how we can identify early predictors of spoken language development in these children.

We also look at sign language development but oftentimes when we talk about linguistic input, we're specifically referring to spoken language input.

Which independents obviously not the only linguistic input that children can get.

But within our scope, that's what we're looking at.

I'm specifically interested in maternal and paternal language input.

This is because there is a very established center strong link between the quantity and the quality of parental speech and language outcomes in all children.

And we have reason to believe that language input is especially important for language development for deaf and hard-of-hearing children.

A lot of the literature on this looks at mom specifically.

And factors that can affect maternal language input.

So oftentimes we think of these factors being socioeconomic in nature.

We look at maternal education as sort of a proxy variable that can predict what kind of language input a child will get.

And the reason for that is traditionally in our cultural context, women have

been expected to take on the larger portion of child rearing.

So we expect moms are more present around their children more often.

And, therefore, have more opportunities to talk to them.

So the types of things that could affect their likelihood to speak will be magnified just by how often they're around.

But I know that fathers do contribute.

And I know that from little bit of looking at the data that I'll talk about later.

So I was interested in seeing just, you know, how that breakdown happens.

A reason to believe that there will be increased participation by fathers during COVID-19 pandemic.

And this came when I read an article actually like an economic article.

That predicted that the impact that COVID-19 pandemic would have on gender equality.

And it predicted for a demographic of parents who were in mother, father home.

So two-parent homes with one mother, one father.

And both working.

It was likely that fathers would pick up some of the slack during the pandemic.

That they would adjust better working from home.

They would be likely to start working from home, and therefore be present for when their kids were home from school during the pandemic while people were staying at home.

And they would be likely to participate more.

So I wanted to get a moment here to stop and ask if anyone has questions just about that theoretical background.

I think we're going to bring the Q&A Box out.

And my co-presenters can chime in as well if anyone has questions. We're

going to lead this in a few moment or to advance the slide.

I think you all might be typing or maybe not.

But I'm going to continue on.

And there will be another time we'll stop to address questions. Or if you need time to type.

Or everything I explained sticks totally well with you, that's also fine.

As we bring research questions, how do ma term and paternal language input differ in families of deaf and hard-of-hearing children? And how were these differences impacted by the COVID-19 pandemic?

I want to take a break to talk little bit about our methodology and our lab and give you context for how I approached answering those questions.

Usually, we used to rely on recording collected in the lab for measures of parental speech input.

I'm going to show you an example of that.

And what that looks like to give you an idea of what we were working with for a long time.

So if you can bring that video clip out and we can play it.

[Video Clip]

>> Hey.

Come over here.

Here.

Do the box.

Can you do the red ones?

Are you not interested in the blocks?

(End of video)

>> So you can see from that video, there are a lot of things that were awkward about that data.

A lot of times when we are trying to elicit speech in lab, we get an arbitrary task that approximate how parents play at home. And this varies when you're coming into a new place.

And been given a constructive activity to do, it may not come naturally.

And you can see this child is not interested in playing with the box.

So that is one challenge collecting data in this way.

You can see here we were using one camera, so we had one view of the child and face was away from the camera, and the father's face was partially obscured.

Also the mic came unclipped during the course of the recording. And that's just within about 30 seconds.

So it's not, you can see it's not exactly the best example of how a parent might talk to their child in real world.

So this is where LENA technology comes in.

This stands for language environment analysis. This works like a step counter but for words.

We give families a packet that includes a device that is illustrated here.

The device is easy to use.

And it has about 16 hours of recording capacity.

We instruct the families to record on a normal day.

A take when the child might not be exposed to any other children.

First of all, they can contaminate the data and first of all, we like to keep our ethics in order.

And LENA gives us a lot of automated measures that I'll talk about in a second.

And then we're able to listen to the recording in its entirety.

And a lot of my time is dedicated to coding that data.

One of the automated measures LENA returns is a word count. This is that.

So adult word count is estimation of how many words a child is exposed to. It picks up everything within a 6-foot radius and give us a number. And this is how many words the child heard that day.

Word count is then broken down by LENA perception of the sex of the speaker. This is based on frequency and different acoustic and phonetic properties.

And obviously, LENA doesn't always get it right.

But it gives us pretty good estimation of adult words were spoken by adult female and how many were spoken by adult female.

And we can use those as sort of correlate variable for maternal and paternal language input.

So now I'm going to play for you some samples from LENA.

I'll give you a chance to contrast that data with the video that I played just a few minutes ago.

This is the first one.

[Video Clip]

>> Pink.

Pink.

Pink.

The color is pink.

Pink.

No, pink.

Yeah, pink.

Pink.

Yep.

What's on there? Is that a mouse?

Is that a mouse?

Mouse.

What does the mouse say?

No, mouse says, squeak, squeak.

Squeak, squeak.

No, that's a piggy. Piggies go oink, oink.

>> So that was an example of audio from a LENA recording.

The mother talking with her child while they were reading a book.

I'm going to immediately play another example of the same family and the father talking to the child.

>> You want more?

Hold on. You don't have to squeeze it.

Daddy will pure it daddy will pour it.

Mmm...

Come here, you have grass in your face.

You have grass on your face.

Yeah.

>> So messages about the chat you might not have been able to hear those.

So I'll go back to the first sample and we'll try playing it again.

>> Pink.

>> Pink.

>> Yeah. Pink.

>> Pink.

>> Pink.

>> The color is pink.

>> Pink.

>> No, pink.

Yeah. Pink.

Pink.

>> Bear.

>> Yep. Pink.

>> What's on there?

Is that a mouse?

Is that a mouse?

Mouse.

What does the mouse say?

No, mouse says squeak, squeak.

Squeak, squeak.

No that's a piggy.

Piggies go oink, oink, oink.

>> What does a --

>> Was everyone able to hear that? Okay, great.

I'm seeing your yeses now. I'll move on to the next one.

This is father from the same family.

>> You want more?

Hold on.

You don't have to squeeze it.

Daddy will pour it.

Okay?

Mmm...

>> What?

Come here, you have grass on your face.

You have grass on your face.

Yeah.

>> So I hope you left hand to the example.

You can hear a few things. The first is just how quality is different with the parental speech we get out of LENA. It's the type of sample we try to collect in the lab.

Much more natural. We hear families doing their daily activities. The mother is reading to the child. And the father is guarding with her.

And the second thing is sort of an impression of how speech from different parents can very just within one family.

So I'll just go back to this and play the sample again.

But in the first sample where the mother was reading to the child, you can hear a lot of back and forth between mother and child.

They were talking about pink, and asking what the various animals in the book said.

And here, in the second sample, there were more environmental sounds which can be acoustic environment.

The father was also getting few responses back from the child.

And that could be what we call the facilitative language techniques or ways of speaking that elicit interaction with a child.

You ask fewer questions and use more directed tone like come here and things like that.

So this brings me back to another automated measure from LENA that is very useful and related to those different impressions I just discussed.

And that's conversational turn count.

Pink, pink, pink.

And we get a quantitative measurement of that.

So I'll stop here and see if anyone has questions about LENA or about our methodology in general.

All right, seeing none, I'll keep going.

So we had a larger repository of data from LENA before the pandemic. We already collected 304 unique recording from 42 deaf and hard-of-hearing children.

And 38 children with normal hearing.

Of the deaf and hard-of-hearing group, 22 had cochlear implant.

And 20 had hearing aids.

And their ages ranged from 5 months to almost 3 years.

And we collected these recordings when they had between 3 and 12 months of device experience.

We tried to collect recording from each child once every 3 months.

This is what the breakdown of maternal and paternal speech input looks like before the COVID-19 pandemic.

So you can see the shape of the relationship was relatively similar with female adult word count and maternal speech.

Linking up the majority of the adult word count.

But that overall, children with CIs had less speech.

And then children with hearing aids and then children with normal hearing.

And then the pandemic set in.

So we were able to collect 16 LENA recording from 4 families of children with hearing aids during the early days of pandemic.

6 were collected before and 10 after. All four families contributed at least one pre-pandemic recording. That's important because I want to do compare value for each family from before.

And all were mother/father family and they both worked and had some

education and income level. They were all likely affected by the pandemic and work from home order.

And just fall into that demographic that was described in that economic part I talked about.

So this leads to our first poll question. I want to know what you all would predict to the adult word count measure from LENA.

So we're going to bring the question. Do you think adult word count increased during COVID or decreased? Remained the same? If we can make that link go bigger?

Awesome.

Awesome.

Okay.

All right.

Looks like we stabilized a little bit.

Almost three-quarter of you predicted that adult word count would increase during COVID.

That makes intuitive sense. Because parents are home with their children and there's more time for that to happen.

Right? I'm going to end the poll and show you what happened.

Great.

So let me go back to the slide.

So on the left most far, you can see total here average of all children with hearing aids collected before the pandemic.

And this group of 4.

And each participants. You can see across-the-board the adult word count measure fell on average.

So this is distressing, I think.

And there's been a lot of literature come out in the past, however many months, during this crisis about how stress is disproportionately affecting parents

and mothers.

And when we think about all of that, you can understand that maybe even though parents would be around their children more, they might be talking less.

Here's a look at how that measure performed overtime by participant.

You can see more availability here. But this is a general trend. I have hoped that some take we'll be able to pinpoint when certain policies in Ohio went into effect.

Or each individual family experience events related to the pandemic such as jobless and things of that nature to explain the variability.

But you can see the adult word count.

Overall from March and then into September.

And as things began to wine down.

Wind down with the intensity of increase.

So next poll question.

Given the decrease in word count during the pandemic, what do you think happened to female adult word count? I'm going to have Gunnar bring out that poll.

I see a question. How does LENA differentiate male versus female? I think I talked about this.

I'll give my spiel little bit again while people are voting.

It's based entirely on acoustics. And we actually have evidence that LENA mischaracterized speech sometimes.

So when an adult female is talking for example, it could perceive that it's a child speaking.

And sometimes adult females are categorized as adult males and vice versa.

But it is an approximation.

And we do our best to interpret it.

But best way to address this is hand coding.

Which is also something that we do.

All right.

Looking at the poll, I see that we're pretty split.

Interesting.

So, some people think that female adult word count increased during COVID.

Again, that goes with that logic that I described about adult word count.

That being around more will lead to more words.

Good portion of you in the camp of adult word count increasing have now predicted that female word count will decrease.

And I think that makes sense. We've got a loss of words somewhere, and female adult word count may be where it is.

And given the stress I just talked about as well.

It makes sense it would remain stable. Let's see what action happened. So just like adult word count, female adult word count fell pretty dramatically in fact.

So I think that also it could be attributable to stress. Economic factors that I talked about in the beginning predicted that part of the reason that fathers would take on more child rearing responsibilities would be that working mothers would be particularly vulnerable to the stresses of quarantine and isolation.

And again, looking at that measure overtime. These are in the same shape the adult word count was. This just shows you how much female adult word count and adult word count are correlated with one another.

So this brings us to our next measure.

Male adult word count. Do you think this increased or decreased or missing? Lakes like some of you saw the presentation.

71% of you maybe.

Predict that mail adult word count would increase during COVID.

And that is what it did.

Yeah.

So we can see some increases here on average for 3 out of the four participants and group over.

You can see here this group had significantly fewer adult word or male word adult count prior the pandemic than was average for hearing families.

And so there was room for improvement.

When viewed overtime, you can see that the one family that didn't show an increase of 309.

They it still little bit incidentally.

So just like as predicted, it would increase.

When viewed as a proportion, picture becomes a little bit more clearer.

And you can see the one of the participants, the portion relative to a total word count and male adult word count increased. And it's competitive for some of our participants with total average from before the pandemic from all hearing aid participants.

So here's what that measurement looks like overtime.

So this brings me to my final poll question. How do you think pandemic affected conversational turn count?

Okay, I'm going to end the poll. So many of you predicted that conversational turn count would decrease.

I'm seeing some are requesting to see the male word count again. So I'm address this poll if go back.

So, yes.

So many of you predicted that conversational turn count would decrease during COVID. And that's a pretty, likewise prediction given just like some of the qualitative differences that we might have seen between mothers speaking to their children.

Fathers speaking to their children. And just the overall adult word count. I'll

leave it a mystery while we go back.

So the person who requested a question.

Oh, this is proportion. Let me show you again.

All right.

I'm going to keep going.

And maybe we'll have more questions at the end.

So this is conversation turn count during and before the pandemic. And you can see each has their own sort of normal.

And all of them decreased somewhat than others.

But I think this is just probably my favorite part of the whole presentation.

Because this is just so clear what happened here.

The conversational turn.

So this brings me to summarize our overall finding.

The adult word counted trended down during the pandemic. And this is due in part, large part to decrease in average female word count across the family. Meantime, male word count trended up as to the average proportion of male adult word count.

So we are seeing that upward shift and participation in childcare. At least as far as spoken language input is concerned.

But is this enough to stave off our worries? Probably not.

Given that conversational word count went down.

And engage dads in early intervention.

Since they're taking on more participation in the language environment.

And they could hopefully be coached to use facilitative language techniques to, you know, elicit more of the conversational turn.

And I would say conversational turn has proven to be correlated with significantly language outcome.

So they're a very great predictor as everything you can probably guess.

They essentially correspond with talking back with their children.

The chief limitation is the sample size. Unfortunately, it's very small just for four families. That's what we had during the pandemic. And I'm glad that we were able to see something each with just the small group.

But, obviously, it would be much more insightful if we had more families, especially, families and children with CI and normal hearing as well. Some of these recordings were done on work days versus week days. But I will say within the families, they were done consistently either on a week day or work day. So before-and-after comparison by participant should be pretty legitimate.

If the family worked on the Wednesday on the work day during the pandemic, they also recorded on Wednesday.

And also adult count.

Conversational turn count is more predictive of language outcome. But it can only approximate what we call direct speech.

Just because a child is over hearing words doesn't mean those words are directed to them. And we have reasons to believe that those words being directed to them is especially important for this vulnerable population.

And that's why we go through and code these audios as well.

And so conversational trends could approximate probably how much language input is directed to these children.

But it's also an approximation. There's going to be fluctuation between the line.

And I think that, as I've mentioned, these might be a function of different conditions of the pandemic.

Aid home orders. Different workplaces having different return to in-person work policies.

Some families experiencing unemployment.

We didn't get any measures of parental stress or personal compliance with, you know, early intervention programs during, or actually, we did get some

measures during the pandemic.

So our insight into, you know, these parents' involvement with their children in early intervention is limited.

And then there's different siblings.

And some of them were involved in virtual schooling.

And all of them were involved in increased amount of virtual communication. LENA categories any speech that comes through virtual means like a video chat or phone call as some form of TV or media.

I think it would be fair to assume that speech coming through a virtual means would be acoustically degraded and probably not useful or salient for language development.

But it could still have some positive effect, some positive, you know, something could be gained from that type of exposure. So that would be another thing to explore. We're also looking at how these changes during the pandemic are correlating with language outcomes.

And I have prepared a poster submission for 2022 on that topic. So you can all attend and see and find out what I found.

So with that, I'll conclude the presentation and open the floor for questions.

>> All right. This is William Eiserman again from the EHDI NTRC.

Thank you, Molly, for your presentation.

It's really wonderful.

It's wonderful that we can take a moment and step back from this ongoing experience with COVID.

And think about the things that we're learning.

And you're inviting a really helpful opportunity for all of us to do that.

I'm going just expand the Q&A field here a bit and see if there are other questions that have come in.

That perhaps we want to if I have you an opportunity to directly speak to regarding your topic for today.

As we wait to see, Molly, if there are other thoughts or questions that people have.

When you look forward to this daunting prospectus that this challenging attic is not over, and when people ask you about the guidance how to make these the best future opportunities, what kinds of words of wisdom do you have for families, or for intervention providers about this.

>> So that's an excellent point, Will.

This crisis doesn't seem to be dissipating. And as much as we all like for it to end, and go back to some normal.

It doesn't seem to be very likely.

I'm in an interesting position.

I'm pretty early in my career. And I've spent all of it on research side of things.

So I all of which feel unqualified to give people advice or, you know, address these big concerns.

But what I will say it's clear that this is different.

And I think the first step is accepting that difference.

And moving forward and knowing that's the old model aren't necessarily going to work for us anymore.

So whether I'm talking to parents or providers.

I think that's at the heart of what we would need to discuss is, you know, -- one is not able to do the same level of direct intervention sometimes anymore.

Or our family dynamics are changing, and we need to adjust our program to better fit our situation at home.

>> Thank you.

Yeah, and I think having patience, right? [Laughter] With everyone involved.

Let's see.

I'm looking to see if we have any other questions.

Because we had so many questions that were being addressed along the

way, we may not have any stored up questions that we can dialogue about now. But that's okay.

What's that?

>> I'm seeing one question. I'm seeing a question here. Do you think the LENA device has critical implications for providers to use? So, yeah, I think that just some of the providers of the participants in our studies have said that much that reports from Lena that we are able to provide them with reports, provide families upon request and they're able to share with their providers. And provided really good insight into the language environment of their patients.

So you can see, I just talked about few of the measures here.

But really big one is noise.

And exposure to things that can crowd out the acoustic environment or preclude speech participation.

So television for example, is the kind of thing where if you see a lot of that as a provider on a report from LENA, you might advise the family to try to do language acquisition with the TV off for example.

>> Okay. I don't see any other questions here.

So thank you, Molly.

And to your colleagues for your preparation, and the delivery of this.

Carrie Davenport and Derek Houston.

Thank you again to our closed-captioning for today's services.

Our captioner, I should say.

And everybody who took the time to be on our webinar today.

Remember that today's webinar has been recorded.

And that means it will be posted on infanthearing.org in the next couple of days so if you or others would benefit from streaming this again, it will be available there for you to do that.

So thank you, everyone.

Before you run off, we're going to show you an access point for getting

going to show you an access point forgetting a certificate for the webinar as well as to give feedback on different aspects of today's webinar.

So if you wouldn't mind clicking in the middle of your screen where you see to get your certificate.

That would be great.

Molly, again, thank you so much.

>> Thank you.

Thank you, everyone, for attending as well.

(Audio recording for this meeting has en