



Talking *with*, not just *to*, a child makes all the difference

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In 1995, Betty Hart and Todd Risley published a groundbreaking study that demonstrated the influence of a child's home language environment on children's later outcomes. They found that, by age 3, children from higher income families were exposed to 30 million more words than children who were from families with low incomes. This difference correlated with significant language and academic differences later on. The bottom line... children who heard more words had better outcomes.

The "30 million word gap" continues to garner much attention and research in an attempt to improve the academic and language outcomes of children from low income families. One line of inquiry, recently investigated by Rachel Romeo and her colleagues, concerns the mechanism that underlies the environment-outcome relationship. (Romeo, Leonard, Robinson, West, Mackey, Rowe & Gabrieli, 2018). Put another way, these researchers tried to answer the question:

How, exactly, does the language environment influence children's outcomes?

Study: Beyond the 30-Million-Word Gap: Children's Conversational Exposure is Associated with Language-Related Brain Function

According to Romeo, whenever there's an environmental effect on behaviour, one has to assume that there's a neural mechanism involved (Romeo, R., LENA Webinar, 2018). So, Romeo and her colleagues not only wanted to understand the relationship between children's language environment and their outcomes, but also determine the neural mechanism that underlies it.

The researchers studied 36 typically developing children from ages 4 to 6 years who came from a range of socioeconomic (SES) backgrounds. Their study involved the following:

- Assessment of verbal and nonverbal cognitive skills – This provided a picture of children's receptive and expressive language skills as well as their reasoning, working memory, and processing speed
- Recordings of home language environment – The children wore a digital recorder (LENA device) on a Saturday and Sunday which recorded the total number of adult words the child heard, the number of child utterances, and the number of conversational turns (defined as an adult utterance followed by a child utterance, or vice versa)
- Functional Magnetic Resonance Imaging (fMRI) – Children listened to simple, short (15 second) stories while undergoing an fMRI scan. This provided information about their brain responses during natural language comprehension tasks

Study Findings

After analyzing all of the data, Romeo and her colleagues found some very interesting answers to their questions (Romeo et al., 2018):

How is SES related to children's skills?

- **SES was correlated with children's cognitive skills** – parents' level of education (but not income) was related to children's nonverbal skills. Parents' education and income were positively correlated with children's verbal skills.
- **There was a stronger relationship between SES and verbal skills than nonverbal skills** – SES exerts a stronger influence on language and literacy than other cognitive domains (Romeo, R., LENA Webinar, 2018)

How is SES related to children's language exposure?

- **SES was correlated with children's language exposure** – children from families with more education and higher income heard more words per hour and had more conversational turns with their parents. If extrapolated, the authors' data would accumulate to approximately a 30 million word gap, similar to Hart and Risley's (1995) finding.
- **SES explained only a moderate amount of the variability in children's language exposure** – this meant that there was a lot of variability of language exposure within groups of families with similar SES
- **SES was not correlated with children's utterances** – which meant that the more privileged children in the study weren't necessarily more talkative than the other children (which would have influenced the data) (Romeo, R., LENA Webinar, 2018)

How is language exposure related to children's skills?

- **Conversational turns most strongly predicted children's verbal scores** – while all three measures of language exposure (adult words, turns, and child utterances) correlated with children's language skills, conversational turns had the strongest relationship
- **After controlling for SES, only conversational turns contributed unique variance in verbal scores** – Romeo explained that this result implied that SES wasn't the whole story, and that there was something special about turns (Romeo, R., LENA Webinar, 2018)

How is language exposure related to brain activity?

- **Conversational turns had a positive relationship with activity in "Broca's area"** – children who experienced more conversational turns had more activation in Broca's area (the left inferior frontal region of the brain), an area highly involved in speech production and language processing
- **Correlation between conversational turns and brain activity exists even after controlling for many variables** – including the child's SES, cognitive ability, or sheer number of adult words or child utterances
- **Broca's area activation mediated the relationship between number of turns and verbal scores** – the extent of activity in Broca's area explained almost half of the relation between

conversational turns and verbal abilities. This demonstrates that there is a neural mechanism linking turns and children's skills.

- **Together, Broca's area activation and conversational turns explained 23% of the total relationship between SES and children's language skills** – this means that there is both a neural and a behavioural mechanism underlying the word gap. According to Romeo, 23% is quite a large portion of what makes children different from one another (Romeo, R., LENA Webinar, 2018).

What do these results mean for our work with families?

SES doesn't tell the whole story

This study confirmed that children from families with greater income and education tend to have better verbal abilities and greater language exposure. However, there was a lot of variability in language exposure within groups with similar SES. The authors found evidence that SES doesn't tell the whole story as it explained only a moderate amount of the variability in children's language exposure. This means that we can't make assumptions about a child's home language environment based on the family's SES.

Conversations are malleable

It's interesting that family income and education played less of a role than conversational turns did in this study. Romeo explains that this provides a sort of "social optimism," as family conversations are much more malleable to change than a family's socioeconomic status (Romeo, R., LENA Webinar, 2018).

Promote back-and-forth turns

This research highlights the need for parents to be taught conversational turn taking strategies. John Gabrieli at the McCovern Institute for Brain Research at MIT said "our next goal is to work on interventions that will help families have more of these conversations back and forth" (Pryor, 2018). The idea of promoting children's language through parents' responsive interactions is very familiar to us all. This lies at the heart of the Hanen philosophy, and many of the Hanen strategies are designed to encourage turn taking.

When we teach parents and educators to Observe, Wait, and Listen™ (OWL™) and follow the child's lead, we are facilitating positive interactions. When adults take the time to observe their children's interests, and to then follow their lead by commenting and doing something related to what their children are doing, interactions become more connected and a lot more enjoyable. It is within these positive interactions that parents and educators can provide language that is both developmentally appropriate and contingent on the child's interests (Lowry, 2015).

In It Takes Two to Talk® - The Hanen Program® for Parents of Children with Language Delays, to make the importance of interaction even more salient for parents, interaction goals are established for the children before focusing on specific language targets. Parents learn that children need to initiate (take first turns), take several back and forth turns (more turns) and have fun before the focus can shift to language goals. Parents learn that "children who lead get the language they need" (Weitzman, 2017).

As speech-language pathologists providing early language intervention, we need to reinforce to parents and educators that children learn language through high quality interactions. Children learn best when they are active participants in enjoyable conversations or interactions. Hearing words isn't enough. Children need to be engaged and willing participants in an interaction that continues because the adult is

giving the child ongoing opportunities to initiate and take additional turns. Romeo and her colleagues have confirmed what we already knew, but now we have some specific research that will help parents understand why talking to children isn't nearly as powerful as talking **with** them.

References

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