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RESEARCH PROVIDES SOCIOECONOMIC CLUES

Study: Poverty A Challenge To Hearing

Tracing Income Levels To Word Interpretation

BY WILLIAM WEIR
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There's been plenty of research on the different ways that poverty can take a toll on children — health, literacy and behavioral problems, for instance. A new study now looks at how socioeconomic status can affect hearing.

Erika Skoe, a University of Con-

necticut professor in the department of speech, language, and hearing sciences, has looked at how children's backgrounds can shape the way their brains interpret different sounds.

The differences could be contributing to the achievement gap in learning between children of different economic backgrounds, Skoe said, and identifying them could be a step toward narrowing that division.

The study was published last month in *The Journal of Neuroscience*.

The research builds off a 1995 study by researchers Betty Hart and Todd R. Risley, who monitored for three

years the conversations of 42 families with children between 7 and 9 months old.

They found that children from families receiving welfare heard an average of 616 words an hour while children from professional families heard an average of 2,153 words an

HEARING, A7

ERIKA SKOE'S research centers around the connection between socioeconomic standing and how the brain processes sound.

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Union At Pratt: Strong Hand

DAN HAAR

COLUMNIST

It has been a sad bedrock of Connecticut's modern industrial history: As factory unions lose members, their political heft and bargaining power withers.

At Pratt & Whitney, the prime example, the ranks of Machinists union members in the jet engine maker's home state have thinned to 2,700, down by 700 in just the past three years, and down from 11,000 in 1993.

Technological advances, recessions, outsourcing and the movement of work to lower-cost places have turned the hourly Pratt workforce into just another labor group — far from its old perch as the keystone of Connecticut's metalworking might.

As the union and company negotiate a new contract with a Dec. 8 deadline, it's natural to think that the Machinists will gamely protest while the company continues to work its economic will. Some Machinists derisively say that this generation in the shops — averaging more than 58 years old — will be the last. The company's latest proposal, aimed at replacing 252 materials handlers and truckers with outside contractors, would knock the Machinists' rolls down below 2,500.

HAAR, A6

MIDWEST TORNADOES

BRUNT OF THE STORM

TORNADOES THAT TOUCHED DOWN on Sunday afternoon in the Midwest left towns devastated, including Washington, Ill., which is home to 10,000 people. Rep. Aaron Schock, R-Ill., told Fox News: "Literally, neighborhoods are completely wiped out. I'm looking at subdivisions of 20 to 30 homes and there's not a home there." At least five people were killed in the storms. A look at the devastation in Washington is below. **Page A12**



TASOS KATOPODIS | GETTY IMAGES

QUICK TAKE

Giants Roll On

Jason Pierre-Paul returned an interception for a touchdown as the Giants defeated the Packers 27-13, winning their fourth straight to climb back into the NFC East race. New York (4-6) moved within 1 1/2 games of division-leading Philadelphia. **Sports, Page C1**

Doris Lessing Dies

The novelist Doris Lessing, who tackled race, ideology, gender politics and the workings of the psyche in a prolific and often iconoclastic career, died in London. **Page A8**

Moving On To New Job

After nine years leading the Noah Webster House and the West Hartford Historical Society, Christopher Dobbs starts his new position as head of the Connecticut River Museum in Essex on Monday. **Connecticut, Page B1**

Middletown Celebration

Middletown's 28th annual Holiday on Main event begins on Nov. 29, and organizers expect it will be by far the largest holiday celebration in the event's history. **Connecticut, Page B1**

CASINO VOTE

Crucial Test For Foxwoods Plan

Milford, Mass., Goes To Polls

By MATTHEW STURDEVANT

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MILFORD, Mass. — A town vote Tuesday on Foxwoods' \$1 billion plan to build a resort casino off I-495 will cap a roller-coaster seven days for the developers, including a grilling before a state commission, conditional approval to proceed and the announcement that they finally had obtained financial backing.

The Mashantucket Pequot Tribal Nation, which runs Foxwoods, suffered the misfortune of having had a hear-

ing before the Massachusetts Gaming Commission less than a week before the host community vote required of all casino proposals. The hearing, to determine if Foxwoods is suitable to run a casino in Massachusetts, raised the uncomfortable issues of Foxwoods' debt load, declining revenues at its Connecticut casino and its difficulty in finding equity investors for the Milford project.

The project, Foxwoods Massachusetts, calls for a resort casino with a hotel, retail

CASINO, A9



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CLASSIFIED.....C8
COMICS.....B6, B7
LOTTERY.....A2

OBITUARIES.....B2, B4
PUBLIC NOTICES.....C8
PUZZLES.....B7

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SPORTS

Hearing

Continued from Page A1

hour. The study gave rise to the phrase "the 30 million word gap."

Exactly why there's such a stark difference in word usage among families of different means is unknown, but Nina Kraus, professor of neurobiology at Northwestern University in Chicago and co-author of the most recent study, pointed to some possible reasons.

"There's less emphasis on reading, and if [the mother] has less education, it may coincide with other environmental factors — perhaps the mom is holding down more jobs and the kid is watching more TV," she said.

Hearing words on television, the researchers said, doesn't add to linguistic development.

"Those same sounds are going to be uttered whether the kid is interacting with the TV or not, so it's not a dynamic experience," Skoe said. "The TV isn't going to correct a kid if they mis-

speaks." Skoe and her fellow researchers wanted to see how deeply ingrained this word gap takes hold in some children. For instance, does it have origins deep in the brain?

To find out, they tested the hearing of 66 ninth-grade students from the Chicago area. The students were divided into two groups according to their mother's education levels. In one group, the students' mothers had a high school degree or less.

Mothers of the students in

the other group had at least some college, and most had an associate's degree or higher. Maternal education levels, Skoe said, are a reliable indicator of income levels.

For the test, an earphone that emitted the sounds of different syllables was placed in one ear of each child. The children, who watched a movie while taking the test, wore caps with scalp sensors that picked up their brain activity. The tests pick up subtle differences in auditory processing, Skoe said. Even though a child

may pass a standard hearing test "with flying colors," his or her brain might be processing sounds abnormally.

With an electroencephalography (EEG) machine, the researchers could measure the activity in the auditory brain stem, a part of the brain that responds to sound stimuli automatically. Among those whose mothers had received more education, the sounds were processed more faithfully. The researchers could tell this by looking at the brain waves, which closely resembled the sound waves of

the audio signal.

In those whose auditory processing proved faulty, the brain waves differed from the sound waves. What's more, how they processed the same sound on subsequent tests differed each time. That's important, Skoe said, because those differences make it very difficult to quickly discern the meaning of a sound.

"The analogy would be like listening to a telephone where there was static in the background," she said. "You'd be talking to someone, but there'd also be a 'shhhhhhhh' at the same time."

Overwhelmingly, the students with the most variability in their auditory processing were in the group with mothers with low education levels.

Based on the 1995 study and several follow-up studies, Skoe said, it's likely that the children whose brains processed sound less accurately experienced a lack of conversation and other adverse effects, such as noise pollution.

"We're making assumptions based on a lot of research out there that has shown an association between socioeconomic status and these adverse conditions," Skoe said.

There's no easy solution to creating an environment of "auditory enrichment," especially for families struggling to get by, Skoe said.

But engaging their children in conversation as much as possible is one thing parents can do, she said. Also creating opportunities for them to take up an instrument or learn a new language could help.

Skoe, who came to UConn from Northwestern this fall, said she now wants to conduct further studies to get a better sense of exactly how and when auditory experiences shape the brain's response to sounds.

"Our brains' ability to process sounds, is that dictated by what happens to us early in life, or could it be that other experiences could come along?" she said. "You start playing a musical instrument, you start speaking a different language, can that override what's happened [earlier] in life?"

Doug Whalen, a linguist and head of research at Haskins Laboratories in New Haven, agreed that there are no easy answers toward closing the gap between families of different means.

"I have a great deal of sympathy for poorer parents because they're struggling with all sorts of demands that middle-class parents don't," said Whalen, who was not part of the study. "Talking to [their children] more is a good first step."

He said the study is a good addition to the increasing awareness of the importance of early language.

"This particular assessment of brain activity is really new," he said.

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Museum Installs Its First Exhibits

Washington Post

WASHINGTON — The massive 500-ton cranes gently lifted the Jim Crow-era rail car high into the air.

Constitution Avenue had been closed since early Sunday morning to make way for the artifact, which was slowly lowered into the construction pit of what will become the Smithsonian's National Museum of African American History and Culture.

Tourists and history buffs were there to see the Southern Railway car, which required its black passengers traveling into the pre-civil rights South to contort physically to conform to the smallness of their second-class citizenship.

Many were also there to see the platform and legs of a 1930s guard tower from the Louisiana State Penitentiary, known as Angola, lowered into the pit, followed by its concrete tower with a corrugated steel roof.

They were there as the museum, scheduled to open in late 2015, completed the first of perhaps 10,000 artifact installations.

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