

Young Children's Exposure To Audible Television Has Implications For Language Acquisition And Brain Development

ScienceDaily (June 2, 2009) — In a new study, young children and their adult caregivers uttered fewer vocalizations, used fewer words and engaged in fewer conversations when in the presence of audible television. The population-based study is the first of its kind completed in the home environment, guided by lead researcher Dimitri A. Christakis, MD, MPH, director of the Center for Child Health, Behavior and Development at Seattle Children's Research Institute and professor of pediatrics at the University of Washington School of Medicine.

"We've known that television exposure during infancy is associated with language delays and attentional problems, but so far it has remained unclear why," said Christakis. "This study is the first to demonstrate that when the television is on, there is reduced speech in the home. Infants vocalize less and their caregivers also speak to them more infrequently."

The study looked at infants aged two months to four years old; a total of 329 children were studied. The children wore a small, business card-sized, two ounce digital recorder on random days monthly for up to two years. A specially designed vest with a chest pocket held the recorders at a specific distance from the mouth, and captured everything the child said and also heard during continuous 12 to 16 hour periods. The recorders were removed only for naps, baths, nighttime sleep and car rides. A speech identification software program processed the recorded files to analyze sounds children were exposed to in their environment, as well as the sounds and utterances they made.

Measurements in this study included adult word counts, child vocalizations, and child conversational turns, defined as verbal interactions when a child vocalizes and an adult responds to them vocally (or vice versa) within five seconds.

The study found that each hour of audible television was associated with significant reductions in child vocalizations, vocalization duration, and conversational turns. On average, each additional hour of television exposure was also associated with a decrease of 770 words the child heard from an adult during the recording session. This represented a seven percent decrease in words heard, on average. There were significant reductions in both adult female and male word counts. From 500 to 1,000 fewer adult words were spoken per hour of audible television.

"Adults typically utter approximately 941 words per hour. Our study found that adult words are almost completely eliminated when television is audible to the child," added Christakis. "These results may explain the association between infant television exposure and delayed language development." Christakis further adds that this may also explain attentional and cognitive delays, since it has been posed that language development is a critical component of brain development in early childhood.

For purposes of this study, subjects were excluded if they had any diagnosed language delay, or if the primary language spoken at home was not English. Children served as their own experimental controls, meaning that the natural variation within each child's daily television exposure was compared for each child, looking at the amount of vocalizations and conversational turns that each individual child experienced, on both their high-television days as well as their low-television days. The recordings did not distinguish between foreground television and background television; no determinations were made about whether the children or adults were actively watching the television or it was simply audible in the environment.

The American Academy of Pediatrics' Committee on Public Education specifically recommends against screen time for children under two years of age, urging more interactive play in its place.

"Since 30 percent of American households now report having the television always on, even when no one is watching, these findings have grave implications for language acquisition and therefore perhaps even early brain development," added Christakis. "Audible television clearly reduces speech for both infants and their caregivers within the home, and this is potentially harmful for babies' development. There is simply nothing better for early childhood language acquisition than the spoken and imitated words of caregivers, and every word counts. Television is not only a poor caregiver substitute, but it actually reduces the number of language sounds and words babies hear, vocalize and therefore learn. We are increasingly technologizing infancy, which may prove harmful to the next generation of adults."

Recorders, vests and software from the LENA Foundation provided data collection. LENA is a language environment analysis system designed to provide parents, clinicians and researchers with information about the language environment of infants and toddlers.

Tips and resources for parents and caregivers include the following recommendations:

- * For babies: Avoid TV for babies under age two. Choose activities that promote language development and brain growth such as talking, playing, reading, singing and enjoying music.

For children over age two:

- * If you allow TV time, choose age-appropriate programs. Involve older children in setting guidelines for what to watch. Use guides and ratings to help, but beware of unproven claims that programs or DVDs are educational. Even cartoons produced for children can be violent or over stimulating.
- * Limit TV time to no more than two hours per day. Less is better.
- * Keep TV off during meals.
- * Set "media-free" days, and plan other fun things to do.
- * Avoid using TV as a reward.
- * Turn off TV when a chosen program is over. Don't leave TV on as background filler or while engaging in other activities. When no one is actively watching, turn TV off.
- * Watch TV with your child. Talk about what you see and engage with your child about the content.
- * Keep TVs out of bedrooms.

Christakis' research partners participating in the study included: Frederick J. Zimmerman, PhD, and Michelle Garrison, PhD, both of Seattle Children's Research Institute and the University of Washington School of Medicine; with Jill Gilkerson, PhD; Jeffrey A. Richards, MA; Dongxin Xu, PhD; Sharmistha Gray, PhD, and Umit Yapanel, PhD, all of the LENA Foundation.

Journal reference:

1. Christakis et al. Audible Television and Decreased Adult Words, Infant Vocalizations, and Conversational Turns: A Population-Based Study. *Archives of Pediatrics and Adolescent Medicine*, 2009; 163 (6): 554 DOI: 10.1001/archpediatrics.2009.61

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