

Team explores links between grammar, rhythm

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A child's ability to distinguish musical rhythm is related to his or her capacity for understanding grammar, according to a recent study from a researcher at the Vanderbilt Kennedy Center.

Reyna Gordon, Ph.D., a research fellow in the Department of Otolaryngology and at the Vanderbilt Kennedy Center, is the lead author of the study that was published online recently in the journal *Developmental Science*. She notes that the study is the first of its kind to show an association between [musical rhythm](#) and grammar.

Though Gordon emphasizes that more research will be necessary to determine how to apply the knowledge, she looks forward to the possibilities of using musical education to improve grammar skills. For

example, rhythm could be taken into account when measuring grammar in children with language disorders.

"This may help us predict who would be the best candidate for particular types of therapy or who's responding the best," she said. "Is it the child with the weakest rhythm that needs the most help or is it the child that starts out with better rhythm that will then benefit the most?"

Gordon studied 25 typically developing 6-year-olds, first testing them with a standardized test of music aptitude.

A computer program prompted the children to judge if two melodies—either identical or slightly different—were the same or different.

Next, the children played a computer game that the research team developed called a beat-based assessment. The children watched a cartoon character play two rhythms, then had to determine whether a third rhythm was played by "Sammy Same" or "Doggy Different."

To measure the children's grammar skills, they were shown a variety of photographs and asked questions about them.

They were measured on the grammatical accuracy of their answers, such as competence in using the past tense. Though the grammatical and musical tests were quite different, Gordon found that children who did well on one kind tended to do well on the other, regardless of IQ, music experience and socioeconomic status.

To explain the findings, Gordon suggested first considering the similarities between speech and music—for example, they each contain rhythm.

In grammar, children's minds must sort the sounds they hear into words, phrases and sentences and the [rhythm](#) of speech helps them to do so. In music, rhythmic sequences give structure to musical phrases and help listeners figure out how to move to the beat.

Perhaps [children](#) who are better at detecting variations in music timing are also better at detecting variations in speech and therefore have an advantage in learning language, she suggested.

Gordon is passionate about music education, which has declined nationally over the last few decades. She hopes her research may help reverse the trend.

"I've been thinking a lot about this idea ... Is music necessary?" Gordon said. "Those of us in the field of music cognition, we know—it does have a unique role in brain development."

Ron Eavey, M.D., chair of the Department of Otolaryngology, commented about the importance of music research—especially in Nashville.

"We live in Music City," said Eavey, director of the Bill Wilkerson Center and Guy M. Maness Professor of Otolaryngology. "Why is [music](#) appealing? We need to delve beyond peripheral organs into fundamental neuroscience."

"Dr. Gordon's work is charting new and much-needed territory in an area that is increasingly captivating researchers and educators alike," said Elisabeth Dykens, Ph.D., director of the Vanderbilt Kennedy Center and the Annette Schaffer Eskind Professor.

Provided by Vanderbilt University Medical Center

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