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Study uses music to explore the autistic brain's emotion processing

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Music has a universal ability to tap into our deepest emotions. Unfortunately, for children with autism spectrum disorders (ASD), understanding emotions is a very difficult task. Can music help them?

Thanks to funding from the GRAMMY Foundation Grant Program, researchers at UCLA are about to find out.

Individuals with ASD have trouble recognizing emotions, particularly social emotions conveyed through facial expressions — a frown, a smirk or a smile. This inability can rob a child of the chance to communicate and socialize and often leads to social isolation.

In an innovative study led by Istvan Molnar-Szakacs, a researcher at the UCLA Tennenbaum Center for the Biology of Creativity, music will be used as a tool to explore the ability of children with ASD to identify emotions in musical excerpts and facial expressions.

"Music has long been known to touch autistic children," Molnar-Szakacs said. "Studies from the early days of autism research have already shown us that music provokes engagement and interest in kids with ASD. More recently, such things as musical memory and pitch abilities in children with ASD have been found to be as good as or better than in typically developing children."

In addition, he said, researchers have shown that because many children with ASD are naturally interested in music, they respond well to music-based therapy.

But no one has ever done a study to see if children with ASD process musical emotions and social emotions in the same way that typically developing children do.

In this study, Molnar-Szakacs will use "emotional music" to examine the brain regions involved in emotion processing.

"Our hypothesis is that if we are able to engage the brain region involved in emotion processing using emotional music, this will open the doorway for teaching children with ASD to better recognize emotions in social stimuli, such as facial expressions."

The overarching goal of the study, of course, is to gain insights about the causes of autism. Molnar-Szakacs will use neuroimaging — functional magnetic resonance imaging, or fMRI — to look at and compare brain activity in ASD children with brain activity in typically developing kids while both groups are engaged in identifying emotions from faces and musical excerpts.

"The study should help us to better understand how the brain processes emotion in children with autism; that, in turn, will help us develop more optimal interventions," Molnar-Szakacs said. "Importantly, this study will also help us promote the use of music as a powerful tool for studying brain functions, from cognition to creativity."

Approximately 15 children with ASD, ranging in age from 10 to 13, will participate in the study, which is being conducted under the auspices of the Help Group–UCLA Autism Research Alliance. The alliance, directed by UCLA's Elizabeth Laugeson, is an innovative partnership between the nonprofit Help Group, which serves children with special needs related to autism, and the Semel Institute for Neuroscience and Human Behavior at UCLA, and is dedicated to enhancing and expanding ASD research. The project is also being conducted in collaboration with Katie Overy, co-director of the Institute for Music in Human and Social Development at the University of Edinburgh, Scotland.

"The hope, of course, is that this work will not only be of scientific value and interest, but most of all, that it will translate into real-life improvements in the quality of the children's lives," Molnar-Szakacs said.

The GRAMMY Foundation was established in 1989 to cultivate the understanding, appreciation and advancement of the contribution of recorded music to American culture. The foundation accomplishes this mission through programs and activities that engage the music industry and cultural community, as well as the general public. The foundation works in partnership year-round with the Recording Academy to bring national attention to important issues such as the value and impact of music and arts education. The $40,000 grant from the foundation's grant program is generously funded by the Recording Academy. Now in its 21st year, the GRAMMY Foundation Grant Program has awarded $5.3 million to more than 250 noteworthy projects.

The UCLA Tennenbaum Center for the Biology of Creativity advances knowledge about the biological bases of creativity by studying the molecular, cellular, systems and cognitive mechanisms that result in cognitive enhancements and creativity. The center is part of the

Semel Institute for Neuroscience and Human Behavior at UCLA, an interdisciplinary research and education institute devoted to the understanding of complex human behavior, including the genetic, biological, behavioral and sociocultural underpinnings of normal behavior, and the causes and consequences of neuropsychiatric disorders.

For more information, visit www.grammyintheschools.com and www.semel.ucla.edu/creativity.