Monkeys get a groove on, but only to monkey music (w/ Audio)

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Cotton-top tamarins grew calmer after they heard music compositions based on their own calm, friendly calls. But the monkeys became more agitated when University of Wisconsin-Madison psychology professor Charles Snowdon played music that contained elements of their own threatening or fearful calls. Photo: Bryce Richter

(PhysOrg.com) -- Music is one of the surest ways to influence human emotions; most people unconsciously recognize and respond to music that is happy, sad, fearful or mellow. But psychologists who have tried to trace the evolutionary roots of these responses usually hit a dead end. Nonhuman primates scarcely respond to human music, and instead prefer silence.

A new report by Charles Snowdon, a professor of psychology at the University of Wisconsin-Madison, and musician David Teie of the

University of Maryland shows that a monkey called the cotton-top tamarin indeed responds to music. The catch? These South American monkeys are essentially immune to human music, but they respond appropriately to "monkey music," 30-second clips composed by Teie on the basis of actual monkey calls.

The music was inspired by sounds the tamarins make to convey two opposite emotions: threats and/or fear, and affiliation, a friendly, safe and happy condition.

The study, published this week (Sept. 1) in the journal *Biology Letters*, reported that the monkeys could tell the difference: For five minutes after hearing fear music, the monkeys displayed more symptoms of anxiety and increased their movement. In contrast, monkeys that heard "affiliative" music reduced their movements and increased their feeding behavior -- both signs of a calming effect.

Snowdon, a longtime researcher into primate behavior, says the project began with an inquiry from Teie, who plays cello in the National Symphony Orchestra: Had Snowdon ever tested the effects of music on monkeys? When Teie listened to recordings made in Snowdon's monkey colony at the psychology department at UW-Madison, he readily discerned the animal's affective state, Snowdon says. "He said, 'This is a call from an animal that is very upset; this is from an animal that is more relaxed.' He was able to read the emotional state just by the musical analysis."

Teie composed the music using specific features he noticed in the monkeys' calls, such as rising or falling pitches, and the duration of various sounds, says Snowdon, who notes that monkeys are not the only ones who use musical elements to convey emotional content in speech. Studies show that babies that are too young to understand words can still interpret a long tone and a descending pitch as soothing, and a short tone

as inhibiting.

"We use legato (long tones) with babies to calm them," Snowdon says. "We use staccato to order them to stop. Approval has a rising tone, and soothing has a decreasing tone. We add musical features to speech so it will influence the affective state of a baby. If you bark out, 'PLAY WITH IT,' a baby will freeze. The voice, the intonation pattern, the musicality can matter more than the words."

Snowdon, who has sung in choirs for most of his life, adds, "My talking does not necessarily tell you about my emotional state. When I add extra elements, change the tone of voice, the rhythm, pitch or speed, that is where the emotional content is contained."

Monkeys interpret rising and falling tones differently than humans. Oddly, their only response to several samples of human music was a calming response to the heavy-metal band Metallica.

The study opens a new window into animal communication, Snowdon says. "People have looked at animal communication in terms of conveying information - 'I am hungry,' or 'I am afraid.' But it's much more than that. These musical elements are inducing a relatively long-term change in behavior of listeners. The affiliative music is making them calmer; they move less, eat and drink at a higher rate, and show less anxiety behavior."

This change in behavior suggests that for cotton-top tamarins, communication is about much more than just information. "I am not calling just to let you know how I am feeling, but my call can also stimulate a similar state in you," Snowdon says. "That would be valuable if a group was threatened; in that situation, you don't want everybody being calm, you want them alert. We do the same thing when we try to calm a baby. I am not just communicating about how I am feeling. I am

using the way I communicate to induce a similar state in the baby."

The similarities in communications between monkeys and people suggest deep evolutionary roots for the musical elements of speech, Snowdon says. "The emotional components of music and animal calls might be very similar, and from an evolutionary perspective, we are finding that the note patterns, dissonance and timing are important for communicating affective states in both animals and people."

Source: University of Wisconsin-Madison (news : web)