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Study: Language Determines Music Skills

By Jennifer Viegas, *Discovery News*

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Nov. 18, 2004 — The native language of an individual not only influences whether or not the speaker will have perfect pitch, but it also affects any instrumental music that the person might compose, according to two studies presented at this week's Acoustical Society of America (ASA) meeting in San Diego.

Together the studies add to the growing body of evidence that suggests a link exists between language and music, even when the music involves no direct use of words.



Do you have perfect pitch?

Take the test! ([Click here](#)

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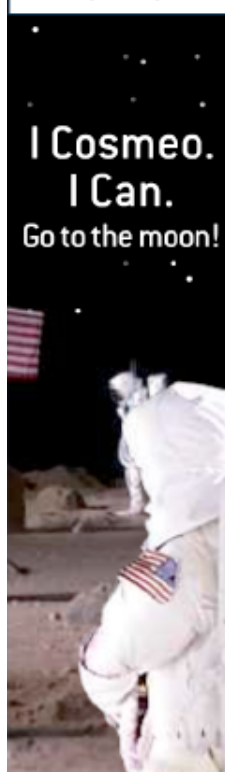
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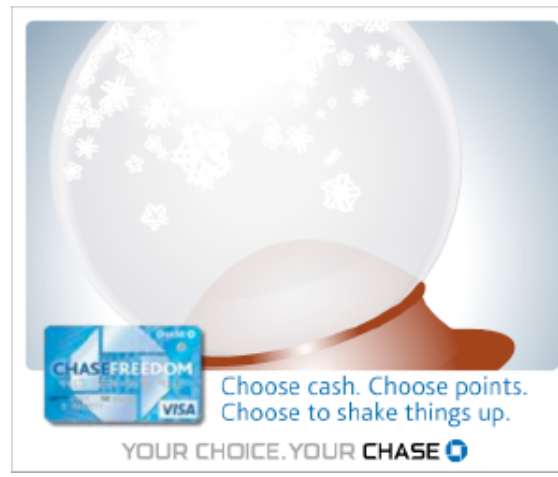
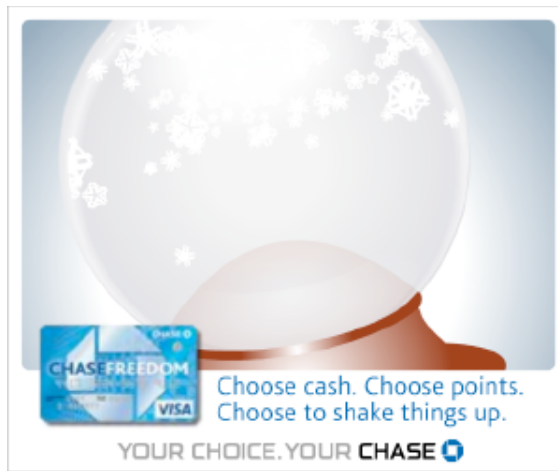
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The research further indicates that perfect pitch is a learned skill that favors “ I am surprised that the speakers of certain Asian languages, and incidence of musical that a composer's native language carries perfect pitch in Chinese over into the music that he or she musicians is so high. ” creates.

For the first study, Diana Deutsch, professor of psychology at the University of San Diego and the paper's lead author, tested 88 students for perfect pitch ability at China's Central Conservatory of Music in Beijing. An individual has perfect pitch when he or she can name or produce a musical note without benefit of a reference note. All of the Chinese students spoke the tone language Mandarin.

Do you have perfect pitch?
Take the test!
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Tone languages, such as Mandarin, Cantonese, Thai and Vietnamese, require that individuals adjust tone and pitch to indicate a word's meaning. For example, in Mandarin, the word "ma" variously can mean "mother," "hemp," "horse" or a reproach, depending on the speaker's tone.

Deutsch and her team next tested perfect pitch amongst 115 English-speaking students at the Eastman School of Music in Rochester, N.Y. For both groups of students, the test involved identifying by name 36 piano notes spanning a three-octave

range, and filling out a questionnaire that included the age their musical training commenced.

While early music lessons improved the likelihood of a student having perfect pitch, the language of the students had a much stronger impact on pitch ability. For students who began musical training between the ages of four and five, 74 percent of the Mandarin speakers passed the perfect pitch test versus 14 percent of the English speakers.

"My hunch is that the differences we found here are based on early exposure to tone language on the part of Mandarin speakers — or put differently, that the rarity of this ability in non-tone language speakers (less than one in 10,000) is due to their lack of early experience with associating pitches with meaningful words," Deutsch told Discovery News shortly after her ASA presentation.

She believes, however, that it likely is possible for all young children to learn perfect pitch when they are first developing their language skills.

Deutsch said, "I believe it would be worthwhile for parents to give their babies the opportunity to bang on a synthesizer keyboard that they could just have lying around on the floor — but they should label the notes with letter names, or color-code the 12 notes within the octave. This would be a simple, inexpensive, and harmless thing to do, that would be fun for the baby and might possibly have dramatic results."

Language and Composers

Aniruddh Patel, the Esther J. Burnham Fellow at San Diego's The Neurosciences Institute and author of the second study, was impressed by Deutsch's findings.

"I am surprised that the incidence of musical perfect pitch in Chinese musicians is so high," Patel told Discovery News. "That's a neat finding. Now the challenge is to show that language, and not differences in musical training, say, is the key factor."

For Patel's own study, she charted the patterns of pace and stress, as well as the intonation, of spoken English and French. She then used a similar technique to chart the rhythm and pitch of classical music written by famous English and French composers, such as Sir Edward Elgar and Claude Debussy.

Patel discovered that the native language spoken by the composers was mirrored in the stress and intonation of their music. In other words, she found that a composer's work is the musical mirror of his or her primary spoken language.

"The techniques we present can be applied to the language and music of any culture," Patel said, and added that even jazz seems to reflect the composer's language. Pop, however, remains a mystery.

Patel said, "Pop may involve a lot more borrowing of musical styles from other cultures, which would blur any differences."

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