The San Diego *Union-Tribune*

UCSD prof makes a hard pitch for perfect pitch | She says most can get it, if they work on it early

David E. Graham
STAFF WRITER

12-Dec-1999 Sunday

The 18th century composer Mozart had perfect pitch, the ability to hear a single musical note, or a sound, and identify it unmistakably: whether C, F sharp, E. It was a talent that infused his works and helped make him a musical genius.

Although it has long been thought that perfect pitch is quite rare and perhaps inherited, a UCSD cognitive scientist is turning that notion on its head. By studying speakers of some Asian languages, Diana Deutsch has concluded that perfect, or absolute, pitch may be quite common -- even universal -- even though it must be developed early in life.

Asians who speak tonal languages, such as Vietnamese or the Chinese language Mandarin, have a form of perfect pitch, Deutsch concluded through experiments that test how individuals speak. Tonal languages are those in which the rising and falling intonations employed when a word is pronounced are critical to the word's meaning.

"It's very clear tonal language speakers have perfect pitch," Deutsch said.

The word "ma," for example, whether spoken with an intonation that is flat, rises, falls or some combination, can alternately mean mother, hemp, a reproach or horse. From very early in life, speakers of such languages are sensitive to these nuances of sound that convey meaning.

In the course of her study, Deutsch found that people would speak the same set of words days apart, yet repeat the words in virtually the same pitch.

"That shows they're making reference to a fixed pitch template in their minds. They must have absolute pitch," Deutsch said recently when she first presented the results of her study at a meeting of the Acoustical Society of America.

If she is correct, it could mean that a memory for perfect pitch "may well be present in infancy universally," she said. Thus, early musical training might help innumerable people develop perfect pitch -- as opposed to a rare few, she said. Previous studies had suggested that perhaps only one person in 10,000 might have perfect pitch.

Even though tonal language or musical training might develop perfect pitch, she said other studies indicate that people who do not have perfect pitch by about age 6 or 7, at the very latest, probably cannot attain it.

Deutsch also said she believes her new study also "relates speech and music in a direct way, which is very profound and which we hadn't acknowledged in the past." Some aspects of speech and music may be processed in the same part of the brain, she said.

Daniel Levitin, a cognitive psychologist at McGill University in Montreal, who has studied perfect pitch, praised Deutsch's work.

"This experiment very strongly argues (that) a great many people can develop absolute pitch, given the opportunity," Levitin said. He believes the same experiment needs to be done with Western languages and others to learn whether the same tendency is found among those speakers.

Deutsch said she is doing just such a study, which is under way now with English speakers.

Deutsch herself has perfect pitch, and she plays piano. She said people with perfect pitch find the ability quite natural, yet quite striking.

She likened the talent to looking at colors and being able to name them: red, blue, green, saffron. In this analogy, someone without perfect pitch might recognize the colors, and recognize that they are different, but have no precise words to apply to them, no way of describing the different hues. Relative pitch, the ability to identify a sound in comparison to another or more notes or sounds, is more common.

In her study, 22 people repeating a set of 12 words days apart pronounced the words with pitch variation, on average, of no more than one semitone, the movement from one key to another on a piano. That, she said, is "extraordinary precision."

A computer analyzed the pronunciations. She did the experiment with Trevor Henthorn of UCSD's Center for Research in Computing and the Arts and Mark Dolson, of Creative Technology Limited, a company in Scotts Valley, Calif.

One language expert said he is not convinced by Deutsch's study.

"The idea strikes me as far-fetched," said Perry Link, a teacher of Chinese languages and literature at Princeton University. "It's just beyond belief to me that there's a tendency in the entire Chinese population to have that because of tonal language."

Even if the speakers somehow remember and speak words at the same pitch, that speech production may have little or no relationship to perfect pitch as it's used in music, Link said. They may have no recognition of what they are doing, he said.

Deutsch believes there is a relationship, however. She said the speakers of

tonal languages not only produce words in perfect pitch, they also perceive perfect pitch. For them to understand words, the words must be enunciated in a tight pitch range. This is a demonstration that they have a sensitive ear for pitch, she suggested.

Once the Asian speakers learn to equate musical notes by name to tones they are speaking, Deutsch believes they should be able to name sounds as notes.

"It's a trivial labeling problem," she said.

Even if it turns out that people are born with a tendency toward perfect pitch, it doesn't mean everyone is a potential Mozart. Deutsch and the other experts agree on that. Mozart also was a genius at composing, the ability to assemble the notes together in compelling litany.

Still, Deutsch believes her study does raise other intriguing possibilities.

"It shows there is a human capacity, or potential, we hadn't realized existed," Deutsch said. "It does raise the question of what other capabilities we have as potentials or actualized that haven't been documented yet."

Some might include talents for mathematics, abstract physics or spatial relationships expressed in art, she said, adding:

"What else is out there that the mind can do that we're not aware of? That's a very, very interesting question."
