



### Hearing Loss

Enhanced Auditory Resources. Expert Assessment & Correction-Newton, MA  
[www.earresources.com](http://www.earresources.com)

### All about Hearing Loss

Causes and Types of Hearing Loss - Advice and Help for Hearing Loss.  
[www.hear-the-world.com](http://www.hear-the-world.com)

### They can't hear the TV?

Solution - TV Ears Wireless Headset Today Only Special Price Free Ship  
[www.TVEars.com](http://www.TVEars.com)

Ads by Google

News

Articles

Videos

Images

Books

Search

Health & Medicine

Mind & Brain

Plants & Animals

Earth & Climate

Space & Time

Matter & Energy

Computers & Math

Fossils & Ruins

## Science News

Share | Blog | Cite

Print | Email | Bookmark

### Neural Pathway Missing In Tone-deaf People

*ScienceDaily* (Aug. 19, 2009) — Nerve fibers that link perception and motor regions of the brain are disconnected in tone-deaf people, according to new research in the August 19 issue of *The Journal of Neuroscience*. Experts estimate that at least 10 percent of the population may be tone deaf — unable to sing in tune. The new finding identifies a particular brain circuit that appears to be absent in these individuals.

See also:

#### Health & Medicine

- [Hearing Loss](#)
- [Nervous System](#)
- [Disability](#)

#### Mind & Brain

- [Hearing Impairment](#)
- [Perception](#)
- [Neuroscience](#)

#### Reference

- [Occipital lobe](#)
- [Functional neuroimaging](#)
- [Amygdala](#)
- [Motor neuron](#)

"The anomaly suggests that tone-deafness may be a previously undetected neurological syndrome similar to other speech and language disorders, in which connections between perceptual and motor regions are impaired," said Psyche Loui, PhD, of Beth Israel Deaconess Medical Center and Harvard Medical School, one of the study's authors.

The authors used an MRI-based technique called diffusion tensor imaging to examine connections between the right temporal and frontal lobes. This region, a neural "highway" called the arcuate fasciculus, is known to be involved

in linking music and language perception with vocal production. Brain images of 20 people were taken, half of whom had been identified as tone-deaf through listening tests.

The arcuate fasciculus was smaller in volume and had a lower fiber count in the tone-deaf individuals. More notably, the superior branch of the arcuate fasciculus in the right hemisphere could not be detected in the tone-deaf individuals. The researchers speculated that this could mean the branch is missing entirely, or is so abnormally deformed that it appears invisible to even the most advanced neuroimaging methods.

"The findings are clear," said Nina Kraus, PhD, at Northwestern University, who was unaffiliated with the study. "They show that the arcuate fasciculus, a structure long-known to join perceptual and motor areas, has reduced connectivity in individuals with tone deafness. Beyond improving our understanding of the anatomical underpinnings of tone-deafness, this study provides new insight into a person's ability to detect pitch," Kraus said.

These findings add to previous work by the same researchers demonstrating that tone-deaf people could not consciously hear their own singing, and work by other researchers indicating abnormalities in brain regions that affect sound perception and production.

The research was supported by the National Science Foundation, the National Institutes of Deafness and Communication Disorders, and the Grammy Foundation.

Adapted from materials provided by [Society for Neuroscience](#), via [EurekAlert!](#), a service of AAAS.

Email or share this story:

More

Need to cite this story in your essay, paper, or report? Use one of the following formats:

- APA Society for Neuroscience (2009, August 19). Neural Pathway Missing In Tone-deaf People. *ScienceDaily*. Retrieved August 19, 2009, from <http://www.sciencedaily.com/releases/2009/08/090818182020.htm>
- MLA

Ads by Google

Advertise here

#### Hearing Loss

Enhanced Auditory Resources. Expert Assessment & Correction-Newton, MA  
[www.earresources.com](http://www.earresources.com)

#### They can't hear the TV?

Solution - TV Ears Wireless Headset Today Only Special Price Free Ship  
[www.TVEars.com](http://www.TVEars.com)

#### Silver Sonic XL: TV Offer

Never Miss a Sound Again with Silver Sonic XL. Now Only \$19.95!  
[SilverSonicXL.com](http://SilverSonicXL.com)

#### Brain Tumor

Discover a Non-Invasive Treatment Alternative to Surgery - Learn More  
[www.tuftsmedicalcenter.org](http://www.tuftsmedicalcenter.org)

#### Disability Application

Free Online Disability Application, Find Out if You Qualify Now.  
[Disability-Social-Security.us](http://Disability-Social-Security.us)

### Related Stories

**Study Identifies Part Of Brain Responsible For Tone Deafness** (Sep. 29, 2006) — A new study has discovered that the brains of people suffering from tone-deafness are in fact lacking in white matter. The study published in the current issue of *Brain* was conducted by a team of ... [> read more](#)

#### Jingle Bells Not Merry For Tone-deaf Individuals

(Dec. 20, 2007) — A new neuroimaging study has found that tone-deaf or amusic individuals have more gray matter in specific regions of the brain related to processing musical pitch (the right interior frontal gyrus ... [> read more](#)

#### Thousands Of Deaf Patients Struggling To Access Basic Health Care

(Oct. 6, 2008) — Thousands of Deaf patients are receiving inadequate healthcare because they are struggling to communicate with healthcare professions, say experts in a new ... [> read more](#)

#### Tone Deafness Explained

(Aug. 26, 2007) — Do people cringe when you sing? You've got company. But researchers have found that only 1 in 20 people truly has amusia, the technical term for tone deafness. Tests have shown that some people with ... [> read more](#)

#### Sign Language At Your Fingertips, Anytime, Anywhere

(Mar. 10, 2007) — The world's first sign language dictionary available from a mobile phone is launched today by the University of Bristol's Centre for Deaf Studies. Mobilesign.org is a video dictionary with over 5,000 ... [> read more](#)

### Just In:

'Microneedle' Patch May Take Sting Out Of Shots

### Science Video News



#### Breaking Sound Barriers

A new high-tech glove enables the translation of sign language into written text, facilitating communication for the hearing or speech impaired. The ... [> full story](#)

[Cochlear Implants Work Better If Done On Both Ears](#)

[Psychologists Use fMRI To Understand Ties Between Memories And The Imagination](#)

[Acoustic Device Allows Sound To Travel Through Bones](#)

[more science videos](#)



### Breaking News

... from [NewsDaily.com](#)

[Mercury-tainted fish found widely in U.S. streams](#)

[REUTERS](#)

[Deaths, lung damage linked to nanoparticles in China](#)

[NASA clears Discovery to fly on Tuesday](#)

[Arms expert warns new mind drugs eyed by military](#)

[Gene experts see high-yield rice in flood zones](#)

[more science news](#)

### In Other News ...

[U.S. deficit estimate to be cut to \\$1.58 trillion](#)

[Judge sets Jan 2010 federal gay marriage trial](#)

[Karzai calls on Afghans to defy Taliban and vote](#)

[Swiss to reveal some UBS accounts, other banks eyed](#)

[Dangerous Hurricane Bill could](#)

**Search ScienceDaily**

Number of stories in archives: 44,032

Find with keyword(s):

Enter a keyword or phrase to search ScienceDaily's archives for related news topics, the latest news stories, reference articles, science videos, images, and books.

Ads by Google

[Advertise here](#)

**Fibromyalgia & Disability**

This Guide Has Already Helped 9,677 Win Disability Income Fibromyalgia! [FreeFibromyalgiaGuide.com](http://FreeFibromyalgiaGuide.com)

**Neuropsychology**

Child Neuropsychology Testing. Neuropsychological Evaluations. [www.BostonNeuropsych.com](http://www.BostonNeuropsych.com)

**MagniEarPlus \$23.95 for 2**

Inexpensive alternative to hearing aid, amplifies soft sound & voices. [www.TheGearAndGadgets.com](http://www.TheGearAndGadgets.com)

[threaten east Canada](#)  
[North Korea sending "good" signals, Richardson says](#)  
[Iraq forces admit lapses after blasts kill 95](#)

[Swiss to reveal UBS accounts to settle U.S. tax battle](#)

[more top news](#)

Copyright Reuters 2008. See [Restrictions](#).

**Free Subscriptions** ... from ScienceDaily

Get the latest science news with our free email newsletters, updated daily and weekly. Or view hourly updated newsfeeds in your RSS reader:

[Email Newsletters](#)

[RSS Newsfeeds](#)

**Feedback** ... we want to hear from you!

Tell us what you think of the new ScienceDaily -- we welcome both positive and negative comments. Have any problems using the site? Questions?

Your Name:

Your Email:

Comments:

Click button to submit feedback: