

## Letter to the Editor

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I enjoyed [your editorial](#) on the problems with definitions in the last issue of *Canadian Audiologist*. As you point out, the definition of sound has traditionally included three components: a vibrating source, a medium and a receiver (i.e., someone hearing the sound). I also tend to think that the receiver requirement is problematic. If a sound needs to be heard in order to be a sound, then it is incorrect to say that hearing aids amplify sounds to make them audible (since they are not sounds until they are audible). It would similarly be incorrect to say that hearing loss makes it more difficult to hear soft sounds, but correct to say that hearing loss may cause soft sounds to stop existing. This is silly. Definitions are only as good as their ability to describe what people generally mean when they use a word. Sound does not stop being sound just because no one hears it, just as light does not stop being light just because no one is looking.

On the other hand, given that we have terms like infrasound and ultrasound, the *possibility* of human auditory sensation needs to be part of the definition. Infra- and ultra-sound refer to frequencies that are too low or too high to be heard by human listeners, so are not considered to be sound. There is clearly a species-based bias in the definition, since sounds that are outside of the audible range for humans may be audible to other animals. If we throw away the need for a human receiver entirely, all vibratory energy in any medium – even at frequencies too low or too high to ever be heard – would be considered to be sound. I don't think this is quite right.

One solution would be to define sound as a vibrating source and medium that could *potentially* induce an auditory sensation in a human (i.e., is audible to the human ear, but not necessarily heard by a particular human ear). This is the way that light is typically defined – as energy that is visible to the human eye, not as energy that is seen by a particular human eye. This gets away from crazy philosophical debates about trees falling in the forest, and the need to define sound based on the presence of a listener (with good hearing thresholds), but it saves us from having to define all vibratory energy in a medium as sound. A vibration at 1 kHz is sound, whereas a 1 MHz vibration is not, because only the former has the potential to induce a human auditory sensation.

The next time a friend asks whether a tree falling in a forest produces a sound, even when no one is there, tell them that the answer is yes, the question is silly, and remind them to wear hearing protection when walking in noisy forests.

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