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| One similarity, crucial to our research, is that humans and mice hear sounds in a very similar matter. Most mammals, including humans, have hair cell bundles called cilia arranged on a strip of tissue in the ear called a basilar membrane. This membrane coils with the cochlea in the inner ear. When sounds generated by mechanical forces are heard, three bones of the middle ear vibrate, which jiggles a part of the cochlea. The vibrations of the cochlea stimulate the cilia, which send out a rapid-fire code of electrical signals about the frequency, intensity, and duration of a sound. The signals are then sent to the brain, where the brain interprets the sound, mainly in the cerebral cortex. Several new techniques, such as the PET scan (positron emission tomography) and the fMRI (functional magnetic resonance imaging) allow researchers to see how the human brain interprets sound. The brain interprets sound in a different area of the brain than it does when it interprets visual images. Because the areas of the brain are different when hearing rather than seeing, our research tests only the *hearing* of violent media and is not coupled with both hearing sounds and *seeing* violent images. In addition, the mouse cannot interpret meaning to the sounds, and so our experiment is testing the raw effects of the sounds of violent media, without the any other variables � such as understanding, bias, or unleashed, past fears connected to the sounds.  While we depend on hearing and the ear, the root of our experiment lies in the brain: memory. Though there are obvious differences in the ways that man and mouse remember information, mice have been traditionally used to test the effects of a certain variable on the memory. One incidence of research that used mice was the investigation of the effects of aspartame on mouse memory by Olney, a professor, neuroscientist and researcher in the department of psychiatry, School of Medicine at Washington University. By studying test groups of mice, he was able to find substantial evidence that consuming such sugar supplements as Nutri-Sweet causes damage to human memory.  The memory is strengthened by repetition, and accordingly, we have run the mice through the same maze under identical conditions in order to test their memories. In addition, memory fades with time, so it was necessary to test the mice on a regular basis. According to Barry Gordon, M.D., PhD. in his book *Remembering and Forgetting in Everyday Life*, there are two main types of memory: immediate and long-term. Immediate memory is defined as a type of echo, usually lasting seven to ten seconds. The second type of memory is long-term or permanent memory, where information lies dormant in the brain and must be retrieved by reactivation. In our experiment, we test long-term memory where the mouse�s memory is "reactivated" each time she progresses through the maze.  Memories are created by the actual firing of nerve cells in the brain that make a record of what was seen or heard. Patterns are created by a certain activity, such as running through the maze, and at the same time, the neurons firing electric signals in the brain establish a connection between themselves so that the pattern can be fired up later. The first process of seeing or hearing information is stored in the cerebral cortex of the brain. Sounds are recorded in the left temporal lobe and sights are recorded in the occipital lobes in the back of the head. Temporary processing of information occurs here. If one is going to remember something for a long period of time, the information will be stored in the thalamus, deep in the center of the brain, or in the hippocampus of the brain.  The goal of our experiment was to detect any negative effects that a plethora of different violent sounds has on the memory of mice, and possibly substantiate that violent media is in fact detrimental, not because of the suggestive violent images and or frightening lyrics, but rather the sheer nature of the sound. As above mentioned, the brain reacts and interprets sounds based on the duration and intensity of the sound. Typically violent music and action excerpts tend to have similar intensities and frequencies.  Both rap and rock music has distinctive sound patterns. Rap music emphasizes rhythmic accompaniment and quality of tone, timbre, rather than harmony, uses synthesized mechanical sounds, and often lacks chord changes. Rock music is characterized by complex technical aspects using chords known tonic, subdominant, and dominant; and many rock songs have similar chord progression such as the *drone,* a single pitch sustained through a progression of chords; and the parallel movement of chords, derived from a technique on the electric guitar known as bar-chording repeated chord patterns called riffs, backbeats which emphasize the second and fourth beats of each measure. Also, screams, gun shots, and yelling have very specific sound patterns that will usually be interpreted in the same manner as other screams, gun shots, and yelling.  On the premise that mice are closely linked to humans in the areas of both hearing and memory, we hope to find substantial evidence about the effects of violent sound on the brain of mice, suggesting that the pure sound violent media either does or does not have a scientifically detrimental effect on the memory of human beings. Obviously, violence in American society is on a rampage; and one way to solve a problem is to secure a cause and effect relationship. By researching the effects of violent sound on mice and using repetition to build long-term memory, we hope to find evidence either for or against violent media.  ([BACK](http://docs.google.com/intro2.html))  [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |