SAY WHAT? FIRST EVIDENCE THAT OUR BRAINS SELECTIVELY FILTER NOISE.

With the start of University and international cricket happening in Dunedin in the last two weeks, a lot of partying has made the news. One of the things that has always amazed me about parties is how we can tune-in to a single conversation, and filter out the music, clinking of glasses, and other conversations. But this ability is surprisingly difficult for people with hearing impairments, even if they have hearing aids. They often find it difficult to pay attention to a single sound and filter out the noise. My father complains that the hearing aids actually seem to make it worse because he can hear even more irrelevant noise. His solution is to take his hearing aids out, but that just removes him from the conversation. And that doesn't sound very nice to me.

The "Cocktail Party Problem" is the name scientists have given to our ability to tune-in to just one speaker at a noisy gathering, and it has puzzled scientists for over 60 years. Exciting new Neuroscience research suggests that the brain is able to recognise and filter out irrelevant noise even before it comes to our attention. Study participants simultaneously watched two videos of people telling a story, and were asked to concentrate on only one of them. While participants were doing this, the researchers recorded their brain activity. With the assistance of some sophisticated kit and clever mathematical computation, researchers were able to track the information from the two videos as it traveled through the subjects' brains. They found evidence that both stories were heard. That is, the actual sounds of each story entered the brain in the same way. This makes sense because we can hear all the sounds at a party, but only pay attention to some of them. Researchers then looked at regions of the brain that are known to be involved with "higher order" functions. These are the things that we sometimes think of as uniquely human, such as using and understanding language. These areas of the brain showed only the activity patterns of the story that the subjects were asked to pay attention to. The brain activity patterns coming from the irrelevant story simply did not exist at these higher levels. This is the first ever evidence that we may be able to direct the flow of information into our brains.

Now that scientists know the places in the brain that only the important information gets to, they can map the pathway that it takes. More importantly, they can now ask what happens to the unimportant information. Why doesn't it get to the same place? How is it filtered out? And why is the filter broken in some people?

REFERENCE: Golumbic et al (2013) "Mechanisms Underlying Selective Neuronal Tracking of Attended Speech at a "Cocktail Party" *Neuron* 77: 980–991