



CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

Name(s) Anika J. Wille	Project Number 36338
Project Title Is Seeing Perceiving? Do Visual Cues Enhance Auditory Attention and Comprehension in a Mixed Speech Background?	
Objectives/Goals The objective of this study is to test if visual cues such as images will improve the comprehension of information when two sentences are spoken at once. Abstract Methods/Materials To test my hypotheses, I conducted 2 sets of hearing tests, each consisting of a video recording of 2 spoken sentences combined with an image. Test #1 contains 2 sentences (sentences 1 and 2) that are dissimilar in words and sentence structure. Test #2 contains 2 different sentences (sentences 3 and 4) that are similar in their properties. Among the 28 male and 32 female subjects I recruited, I randomly divided them into 3 test groups, namely groups A, B, and C. Group A was shown images that were relevant to sentences 1 and 3. The images preceded the recorded sentences in the video, made using iMovie; while group B was shown images that were relevant to sentences 2 and 4. Group C was shown blank images that preceded the same recordings as used for groups A and B. In other words, all 3 groups were subjected to the same voice recordings, but to different visual cues prior to the mixed conversations. Results 1). In general, the performance between the multiple-choice test and written test is comparable. 2). In mixed sentences 1 and 2, the image of a dancer shown to group B significantly improved the understanding of sentence 2. The visual cue of a brown fox also improved the understanding of sentence 1 for subjects in group A, although to a lesser extent. The reason for this difference is unclear, possibly due to the dominant effect of dancer image and the content of sentence 2 on my subjects. 3). In hearing test #2, both visual cues (A. tiger; B. zebra) helped the understanding of sentences 3 and 4. 4). The hearing score of group C did not favor either sentence in both hearing tests. Group C scored lowest overall, due to the fact that they did not have any visual cues helping them. My data suggest that visual cues help enhance the understanding and processing in a mixed speech background, particularly when sentences share similar sentence structure. 5). There is no overall gender difference in the auditory comprehension performance. Conclusions/Discussion Visual cues improve auditory attention and perception in a mixed speech background under most circumstances, particularly when the competing sentences are very similar. There is no overall gender difference in auditory perception of mixed sentences.	
Summary Statement When subjects are presented with a visual cue of an image relating to one of two sentences being played at the same time, the sentence corresponding with the visual was comprehended more clearly over the other.	
Help Received My mentor offered advice on presenting my experiment more clearly, as well as possible ideas for further studies. My parents gave me advice on conducting statistical analyses (t-test).	