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# Extending the Perception of Speech Intelligibility in Respiratory Protection

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In the field of respiratory protection, speech intelligibility is perceived to be the quality of sound transmission through a respiratory interface. This paper aims to explore how speech intelligibility is a complex issue in part comprising of sound transmission, but also of other more subtle, but no less important aspects, such as the visual cues gained from lip movement. The link has long been established as explained by P. Erber in the Journal of Speech and Hearing Disorders, where he states “Hearing-impaired persons usually perceive speech by watching the face of the talker”.

The data and results gathered from this investigation of respiratory interfaces aims to demonstrate how the interaction between hearing and vision is perceived in speech intelligibility and how this phenomenon may be used to advantage by the designer of Respiratory Protective Device systems. With an understanding of this phenomenon, a designer may create a respiratory interface that may help persons with impaired hearing that need to wear respiratory protection in their chosen occupation, be useful members of the workforce. It may also help completely able bodied persons to communicate if their hearing is temporarily lost due to some unforeseen event.

The methodology employed consists of using an adapted modified rhyme test. The test involves “listeners” being able to see the speakers’ lips through the respiratory interface as well as hearing them. The results of ‘seeing and listening’ are compared with ‘listening only’. A third scenario, where the listeners wear ear plugs but can see the speakers’ lips, is also examined. The results are statistically analysed.