

Examining the contribution of visual information in lexical processing in primary school children: Evidence from vowel detection in noise

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Seeing the speaker's articulatory gestures enhances phoneme perception in noisy environments. A recent study showed that when the acoustic signal was deteriorated by white noise, phonemes were better detected when they were embedded in words rather than in pseudo-words. Moreover, this word superiority effect (WSE) was greater when the participants could see the face of the speaker moving (audiovisual condition, AV) than in a condition without information on the articulatory gestures of the speaker (auditory condition, A). This result indicates that visual gestures provide information on phoneme identity and contributes to lexical activation processes during word recognition in adverse conditions. The purpose of the present research was to investigate the contribution of visual and lexical information on phoneme perception in children. Recent data indicated that the contribution of visual information was rather limited in seven and nine-year-old children. Although the children do not have particular deficits in visual speech decoding, they presented a temporary loss of sensitivity to visual information.

In the present study, seven and nine-year-old children had to perform a vowel phoneme monitoring task in bi-syllabic words and pseudo-words. The stimuli were presented in A and AV modality in noisy (-9 dB) and silent environments. In the noisy environment, the results yielded a WSE on phoneme detection scores for seven and nine-year-old children. They also had higher scores in AV than in A. Our results suggest that when the auditory information is deteriorated, visual and lexical information enhance phoneme intelligibility in children. Seven and nine-year-olds process visual information to perceive speech in noise. Surprisingly, the interaction observed in children (i.e., a greater WSE in A than in AV) was the opposite of the pattern observed in adults (i.e., a greater WSE in AV than in A). It suggests that unlike the adult's data, visual information only contributes to phonemic processing in children.