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Andersen, Tobias; Gil Carvajal, Juan Camilo

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P1.43 Audiovisual Integration of Consonant Clusters

Andersen, T.S. & Gil-Carvajal, J-C.

Technical University of Denmark

Seeing incongruent visual speech can alter the auditory phonetic percept. In the McGurk fusion illusion the auditory percept is a single consonant different from both the acoustic and the visual consonant. In the McGurk combination illusion the auditory percept contains both consonants. It remains unclear why some audiovisual stimuli elicit combination illusions. It is also unexplored how actual consonant combinations integrate audiovisually. Here we investigate the integration of audiovisually congruent and incongruent combinations of /aba/, /aga/, /ada/, /abga/, and /abda/. We found that visual stimuli containing a bilabial component (/aba/, /abga/ and /abda/) all facilitated perception of both acoustic consonant clusters regardless of audiovisual congruence. This is surprising because incongruent visual stimuli usually lead to illusory, hence incorrect, responses. The effect was most likely caused by the visual bilabial closure as we found a general increase in bilabial responses. Visual consonant clusters also produced combination illusions for auditory /aga/ and /ada/ and these responses were similar to the combination illusion induced by visual /aba/. The velar and alveolar components of visual consonant clusters did, however, also have an effect on auditory perception as they influenced perception of auditory /aba/ in inducing novel combination illusions where subjects perceived /abda/. Acoustic consonant clusters dubbed onto visual velar or alveolar stimuli created novel illusions. For example, acoustic dubbed /abga/ dubbed onto visual /aga/ created an illusion of hearing /agda/ or /adga/. This illusion could be due to the acoustic /b/ and visual /g/ creating a fusion illusion of hearing /d/ while leaving perception of acoustic /g/ unaffected. This indicates that opening, closing and release stages of consonants can integrate differentially. We hypothesise that this may explain why some audiovisual combinations produce combination illusions while others produce fusion or visual dominance illusions.