Session 2aSCb

Speech Communication: How do Physical and Motor Knowledge Matter to Speech Perception?

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Invited Papers

8:20

2aSCb1. Action-based multisensory integration in striking events. Bruno L. Giordano   (Centre for Interdisciplinary Research in Music Media & Technology (CIRMMT) - Schulich School of Music - McGill Univ., 555 Sherbrooke Street West, Montreal, QC H3A1E3, Canada, bruno.giordano@music.mcgill.ca), Stephen McAdams   (Centre for Interdisciplinary Research in Music Media & Technology (CIRMMT) - Schulich School of Music - McGill Univ., 555 Sherbrooke Street West, Montreal, QC H3A1E3, Canada, smc@music.mcgill.ca), Paolo Crosato   (Dept. of Information Engineering, Univ. of Padova, Via G. Gradenigo 6/A, 35131 Padova, Italy, jimbobaus@virgilio.it), Federico Avanzini   (Dept. of Information Engineering, Univ. of Padova, Via G. Gradenigo 6/A, 35131 Padova, Italy, avanzini@dei.unipd.it), Carmine Casciato   (Centre for Interdisciplinary Research in Music Media & Technology (CIRMMT) - Schulich School of Music - McGill Univ., 555 Sherbrooke Street West, Montreal, QC H3A1E3, Canada, casciato@music.mcgill.ca), Stephen Sinclair   (Centre for Interdisciplinary Research in Music Media & Technology (CIRMMT) - Schulich School of Music - McGill Univ., 555 Sherbrooke Street West, Montreal, QC H3A1E3, Canada, sinclair@music.mcgill.ca), Marcelo M. Wanderley   (Centre for Interdisciplinary Research in Music Media & Technology (CIRMMT) - Schulich School of Music - McGill Univ., 555 Sherbrooke Street West, Montreal, QC H3A1E3, Canada, marcelo.wanderley@mcgill .ca)

Many theories of multisensory integration focus on action-independent perception. This approach has limited ecological validity, because under everyday conditions we frequently act upon multisensory events through motor behavior. We present a novel methodology for the study of multisensory integration in action-directed perception, focusing on striking events. Observers repeatedly hit a virtual object with a target striking velocity, and are presented with various types of sensory information about the striking event: auditory and/or haptic and/or visual. For each of the experimental trials, they initially receive feedback on the tracking of the target striking velocity. In a second phase, feedback is eliminated. In a third phase, the sensory properties of the striking event are changed. We quantify the extent to which a variation in each of the sensory modalities disrupts performance in the tracking of the target striking velocity. Multisensory dominance hierarchies are inferred from the comparison of the patterns of performance disruption in unimodal and multisensory contexts.

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2aSCb2. Amodal specification of talker-specific motor behavior. Lawrence D. Rosenblum   (University of California, Riverside, Department of Psychology, 900 University Ave., Riverside, CA 92521, USA, rosenblu@citrus.ucr.edu)

There is substantial evidence that the speech perception function incorporates information for articulatory motor behavior. Research over the last 15 years has shown that speech perception also uses information for talker-specific motor behavior. Interestingly, this research reveals that talker information can facilitate speech perception whether it is apprehended through auditory or visual speech (lipread) means. The multimodal nature of these effects could mean that the talker-specific properties used by the system are amodal and motoric-or gestural-in nature. Evidence for this proposition-that talker-specific facilitation of speech is based on amodal specification of gestural style-will be discussed. This evidence includes findings that isolated talker-specific phonetic information, available both optically and acoustically, can be informative about talker identity to the degree that it supports cross-modal talker matching. Other evidence shows that the talker familiarity gained through one modality can facilitate perception of speech in the other. Finally, recent evidence reveals that speech perceivers will align to (inadvertently imitate) talker-specific properties of utterances they are asked to shadow, whether that speech is presented auditorily or visually. These results suggest that some of the 'motor knowledge' bearing on speech perception takes the form of talker-specific gestural properties, amodally specified.