

RESEARCH DIRECTIONS

A nod to the wise in motherese

Dr Christine Kitamura and Associate Professor Jeesun Kim of The MARCS Institute along with Dr Gerard Bailly from the National Organisation for Academic Scientific Research are investigating the contribution a speaker's head gestures and facial movements make to the way babies learn language. The project, which is supported by the Australian Research Council, will use the latest animation technology to clone a virtual "talking mother" with controllable features, to explore which visual signals are most important.

'Babies learn language with relative ease and little instruction. This astonishing feat is achieved through an array of cues delivered in ideal conditions – caregiver and infant are face-to-face and close to each other,' says Dr Kitamura. 'Speech to babies is steeped with exaggerations that affect facial expressions, head movements and the register of the voice, but not a lot is known about the general development of infants' sensitivities to the exaggerated gestures or how much they influence speech perception.'

Auditory-visual conversation is information rich. Meaning is derived from the auditory cadence of speech (tone, stress, loudness, pitch and rhythm) as well as from visual cues. The rhythm of syllables, for example, roughly corresponds with the mouth opening and closing. Head gestures – nods, tilts, posture – and facial expressions – movements of lips, jaw, cheeks and eyes – also play a part.

Dr Kitamura's ground-breaking project will be conducted in three phases: collection of speech data from mothers; construction of the interactive 3D "talking mother"; and testing of the clone with infants, to determine their sensitivity to visual speech cues and how such sensitivity develops in the first year of life. The project will boost understanding of how visual cues ground speech development and language acquisition.



This project has significant implications. Developmental progression can be undermined if hearing is impaired, or a language disability impedes speech perception. Not only do poor readers have difficulty with aural comprehension, they are also less able to make use of visual speech information, or to lip read. The screening of infants' hearing now takes place in the critical first year of life. Thus, an understanding of how visual speech gestures promote language learning could lay the foundation for intervention strategies. There is also an industry dedicated to developing Avatars to act as educative tutors, care for children, and entertain with sense of presence. Perceived presence depends on using just those cues to which the target audience – infants, children or adults – are sensitive.

Project Title: Motherese by ear and eye: Infant perception of visual prosody

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