Multimodal Interaction to Support Multilingualism Acquisition and Development in Young Children

Marie-Luce Bourguet
Queen Mary, University of London
Mile End Road
London E1 4NS, UK
+44 (0)20 7882 5200
mlb@dcs.qmul.ac.uk

ABSTRACT
The aim of our research is to explore new interaction paradigms for the design of multilingual educational software. In this poster, we present some early work on the use of multimodal interaction techniques to facilitate the simultaneous acquisition of more than one language during the period of primary language development. We suggest that multimodality can be used to deal with common multilingual phenomena such as language mixing and language dominance or specialization.

Keywords
Multilingualism, multimodal interaction, language acquisition and development, language mixing, modality fission, educational software

POSTER SUMMARY
Educational software systems dedicated to first or second language acquisition are common, but very few systems have been designed to address the needs of young children that acquire multiple languages from birth. Multilingual families often have to rely on a multiplicity of independent educational tools, each of which handles only one of their children’s languages. In response to this situation, the aim of our research is to explore new interaction paradigms for the design of interactive systems that will specifically support multilingualism acquisition and development. We are currently exploring the use of multimodal interaction techniques to address common multilingual phenomena such as language mixing (interactions between the child’s developing language systems) and language dominance or specialization (unequal developments of the languages).

Multimodal interaction refers to the usage of natural modalities of interaction in a user interface, for example speech recognition, gestures and gaze (input modalities); speech synthesis, prosody and smart graphics (output modalities). Typically, a multimodal system is able to coordinate several communication channels that operate in parallel. In particular, the multimodal research community has developed advanced techniques to partition data (modality fission) for the generation of efficient multimodal presentations. Interestingly, during language development children appear to be sensitive to a variety of partially informative “cues” that, when integrated, play an important role in the acquisition of grammatical categories. These cues may be sound-based, prosodic or distributional and are individually unreliable when used alone. They also appear to differ from one language to another. Modality fission techniques can be used to generate and emphasize appropriate cues for each of the languages at hand, thus facilitating word segmentation in each of the languages and accelerating linguistic differentiation.

Alternatively, speech recognition technology, trained on several languages can be used to recognize a child’s speech. In response to a child’s input, multimodal presentations can be generated where occurrences of multilingual elements are highlighted through dedicated output modalities (e.g. colours, shapes or textures). This way, language-mixing occurrences become visually apparent to the child.

A child who uses language A at home and language B at school is unlikely to equally develop the two languages. Multilingual educational systems should be able to compensate for the problems of language dominance or specialization by generating multimodal presentations where both languages are used and presented in their own dedicated output modality.

---


Copyright is held by the author/owner(s).
IDC2003 7/03 Preston, UK