Integrating gesture research with theories of language evolution

Erin Brown
Language Evolution and Computation Research Unit
erin@ling.ed.ac.uk

The study of language evolution has a long history of speculation on a gestural origin for humans' linguistic capacity, including a number of recent theories put forth by Corballis (2002), Arbib (2005) and Tomasello (2008). Although these authors recognise the powerful representational potential of gesture, their theories do not appear to provide a satisfactory explanation for the relationship between speech and gesture as it exists today.

Speech is often accompanied by gestures – spontaneous, idiosyncratic movements of the body, including those of the eyes, head, hands, arms, and legs, among other body parts (Kendon, 2004). A subset of these movements conveys information that is tightly linked temporally and semantically to the co-occurring speech. Such representational gestures possess semiotic properties distinct from those of speech (McNeill, 1992). Speech is fully symbolic, relying on a conventional, arbitrary code for mutual understanding. Gesture, in contrast, is nonarbitrary, so its meaning can be inferred from common knowledge about the world and physical actions. Some authors have pointed to this relationship to propose that language should be viewed as a dual semiotic system, constituted by the complementary representational formats of speech and gesture. Additional psychological and neuroscientific research supports the characterisation of language as a unified speech-gesture system (Holler & Wilkin, 2008; Masson et al., 2008).

I will present a critique of the most prominent gestural origins theories based on evidence from gesture research, comparative data and concepts from the field of embodied cognition. I will argue that recognising language as a coupled speech-gesture system may help to explain a central problem in language evolution: the emergence of symbolic communication. Finally, I will discuss strategies for investigating this hypothesis within the framework of computational modeling.

References

Arbib, M., 2005. From monkey-like action recognition to human language: An evolutionary framework
for neuroscience. *Behavioral and Brain Sciences, 28*, 105-124.

Corballis, M., 2002. *From hand to mouth: The origins of language.* Princeton University Press.

Holler, J. & Wilkin, K., 2008. Communicating common ground: How mutually shared knowledge influences speech and gesture in a narrative task. *Language and Cognitive Processes, 24*, 267-289.

Kendon, A., 2004. *Gesture: Visible action as utterance.* Cambridge University Press.

Masson, M.E.J., Bub, D.N., Newton-Taylor, M., 2008. Language-based access to gestural components
of conceptual knowledge. *Quarterly Journal of Experimental Psychology, 61*, 869-882.

McNeill, D., 1992. *Hand and mind: What gestures reveal about thought.* Chicago University Press.

Tomasello, M., 2008. *Origins of Human Communication.* MIT Press.