

.....Linguistic vs. non-linguistic coarticulation: An ASL study

While long-distance coarticulation has been studied in spoken languages (e.g. Grosvald, 2009; Magen, 1997; West, 1999), this phenomenon appears to be largely unexplored in sign language research to date (but see Bayley, Lucas & Rose, 2000; Cheek, 2001; Mauk, 2003; for related work). In this paper, we discuss results from a study of long-distance coarticulation in American Sign Language. Phonologically, signs may be characterized in terms of four basic parameters: Handshape, Location, Movement and Orientation. Here, we investigate anticipatory sign-to-sign coarticulatory influence on the Location parameter. This sign production experiment also included a “non-linguistic” condition so that we could assess the degree to which the effects seen for signs may be considered language-specific or characteristic of human actions in general.

Five signers were filmed while signing ASL sentences and additionally, were outfitted with motion-capture sensors via which the three-dimensional coordinates of key points of the signer’s body (e.g. the wrists, the back of each hand) could be recorded during the course of the signing of each sentence. The coarticulatory effects of later signs on earlier signs with respect to Location were then investigated, focusing particularly on the vertical dimension. It was expected, for example, that the signs preceding a context sign articulated at the forehead (e.g. HAT) would tend to have a higher z-coordinate (altitude) than when the same signs preceded a context sign articulated at a lower part of the signer’s body like the waist (e.g. PANTS). In the non-linguistic condition, the sentence-final “high”- and “low”-positioned context items were also positioned at the height of the signer’s forehead or waist, but required the signer to flip an appropriately-located switch instead of articulating a sign.

Evidence of coarticulatory effects of one sign on another were found across up to three intervening signs, though they were generally weaker than effects found in analogous spoken-language studies (Grosvald, 2009; Magen, 1997). This difference appears to be due in part to the greater variability among these signers in their articulatory behavior, relative to that of users of spoken language. Results for the non-linguistic condition were substantially the same as those for the linguistic (sign) condition. Therefore, to the extent that location-based effects occurred, it appears that they cannot be deemed specifically linguistic in nature. Even so, the existence of long-distance coarticulation like that found here has implications for models of sign language production and therefore for language production in general.