

ACOUSTICS2008/457

Fine-phonetic variation in a computational model of word recognition

O. Scharenborg

Centre for Language and Speech Technology, Radboud University Nijmegen, Erasmusplein 1, 6525 HT Nijmegen, Netherlands

There is now considerable evidence from psycholinguistic and phonetic research that fine-phonetic variation in the speech signal modulates human speech processing (HSP), and helps the listener segment a speech signal into syllables and words [e.g., Salverda et al., *Cognition* 90, 51-89 (2003)]. This kind of information also appears to help the human perceptual system distinguish short words (like 'ham') from the longer words in which they are embedded (like 'hamster'). Salverda et al. showed that the lexical interpretation of an embedded sequence is related to its duration; a longer sequence tends to be interpreted as a monosyllabic word more often than a shorter one. Until recently, no computational models of HSP existed that are able to model this fine-phonetic variation [Hawkins, *J. of Phonetics* 31, 373-405 (2003)]. In this paper, we present Fine-Tracker, a novel computational model of human word recognition that is able to capture and use this fine-grained acoustic-phonetic variation during speech recognition. Simulations using the recordings from the listener experiments by Salverda et al. show that Fine-Tracker is able to capture and use duration variation in the speech signal to distinguish short words from the longer words in which they are embedded. [Research supported by NWO.]

Keywords: computational model, word recognition, fine-phonetic variation

Technical area: Speech Communication (SC)

PACS #1: 43.71.An Models and theories of speech perception (see also 43.66.Ba)

PACS #2:

PACS #3: