

Mapping of heard speech into articulation information and speech acquisition

Yuen et al. (1) find that hearing an “incongruent distractor” syllable shifts the tongue’s place of articulation when pronouncing a second printed syllable. More specifically, hearing a /t/-initial phone in the distractor causes increased alveolar region tongue-palate contact when a subject seeks to pronounce a printed syllable with an initial /k/ or /s/. (The distractor/printed syllables were nonword stimuli such as /kib/ and /seeb/.) Yuen et al. (1) seek to interpret this effect as a speech phenomenon only in terms of potential speech perception processes. This interpretation overlooks the well-attested existence of a capability within the faculty of speech for overheard speech to be mapped directly and automatically into articulations independently of perception/comprehension.

Brain lesion research shows that such direct articulation mapping occurs in a separate path from speech perception (2). Research with speech shadowing shows that this mapping can be as fast or faster than that when people seek to produce as rapidly as possible the same speech sound (3). The echolalia found in some mentally retarded individuals shows the independence of this mapping from speech comprehension because such speech repetition occurs in the absence of other speech abilities (4).

Although not so obviously a part of speech as its production and perception, the capacity for a speaker to directly map input into output is critical for its acquisition and the intergenerational transmission of spoken vocabulary. This is because it enables a speaker after hearing the pronunciation of an unfamiliar word to incorporate that pronunciation directly into their conversation and spoken vocabulary (5). Consistent with this, competence in nonword repetition is the best predictor (apart from age) of the rate with which children acquire new spoken vocabulary (5). The mapping of novel heard pronuncia-

tions strategically needs to be processed automatically upon all words. This is because speakers cannot know in advance that a word is unfamiliar. As a result they can know a word is in need of input into motor output mapping only after the opportunity to do this has gone. Thus, speakers if they are to incorporate unfamiliar words into their spoken vocabulary must by default map all spoken input to ensure the needed mapping has been done.

Yuen et al. (1) argue that no strategic need exists for subjects in their experiment to recruit the motor system into their task in regard to the distractor words. However, the existence of speech mapping as a separate process from speech perception/production provides a parsimonious—although overlooked—explanation. No reason therefore exists for Yuen et al. (1) to interpret their findings, “in the context of a broader emerging framework, whereby the perception of action entails activation of the motor system.” Such general and non-speech-specific processes might exist but speech repetition processes linked to the need to map unfamiliar speech input into speech output for the propagation and learning of spoken vocabulary are already sufficient to account for their data.

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