Testing the predictions of usage-based models on language change across the lifespan

Laurel MacKenzie (*The University of Manchester*)

Introduction. Usage-based models of language, under which mental representations are phonetically rich clouds of stored memories, have been gaining currency in sociolinguistic research (see Hinskens et al., 2014 for a recent review). These theories propose that a speaker's language production is shaped by the input (s)he receives over time, and specifically that the stored memories of more frequently heard words will be updated more often. Such theories have an obvious connection to what has been called 'lifespan change', i.e. the post-critical period participation of individual speakers in the generational changes ongoing in their community (Sankoff, 2005). Specifically, lifespan change should be driven by frequent words, as memories of these words will be updated more often, making them susceptible to influence from new forms in the input (Nycz, 2013).

Due to the difficulty of obtaining linguistic data from individual speakers across their lives, this hypothesis has not yet been explored. This paper takes the first step in filling this gap.

Methodology. We examine the speech of Sir David Attenborough, a well-known nature documentary narrator whose career spans half a century. Attenborough, born in London in 1926 and educated at Cambridge, speaks with Received Pronunciation (RP), and is thus a prime candidate for examination of the generational changes that have been observed in RP in the twentieth century.

The variable under study in the present paper is the articulation of rhoticity. One feature of traditional RP is the use of tapped [ɾ] in particular phonological environments, such as word-internally after a stressed vowel (e.g. *very, sorry*) (Wells, 1982; Cruttenden, 2013). The use of tapped [ɾ] declined during the course of the twentieth century in favour of the approximant [ɹ] (Wells, 1997; Fabricius, 2014), leading us to examine whether the same has held true within Attenborough's speech as he ages.

We examine Attenborough's speech in two nature documentaries, *Zoo Quest* (1959) and *Planet Earth* (2006), for evidence of lifespan change. Tokens of underlying /ɹ/ after a stressed vowel in both internal (e.g. ve*r*y) and linking (e.g. the*r*e *is*) positions were auditorily coded as being a tap or an approximant. The frequencies of each lexical item (for internal /ɹ/) and each lexical item+following word bigram (for linking /ɹ/) were calculated via the 201.3-million word SUBTLEX-UK corpus, compiled from movie subtitles (Van Heuven et al., in press).

Results. Results of mixed-effects logistic regression reveal that Attenborough exhibits what Wagner and Sankoff (2011) term 'retrograde change': he moves in the **opposite** direction of the community, significantly increasing his use of tapped [ɾ] in *Planet Earth* as compared to *Zoo Quest* ($p < 0.001$). Interestingly, this change is found only in instances of linking /ɹ/; Attenborough shows no significant change in word-internal /ɹ/. Moreover, there is no effect of bigram frequency. We discuss the implications of this domain-specific, frequency-insensitive lifespan change for models of lexical representation, and conclude with a discussion of the potential role of style-shifting in longitudinal linguistic change (Rickford and Price, 2013).

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