Prosodic variation in apparent time in Middlesbrough English

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Middlesbrough is an industrial town located geographically in the north east of England. Changes in administrative boundaries in the latter half of the 20th century 'moved' the town from the North Riding of Yorkshire into Teesside (in 1968), then again into County Cleveland (in 1974), before the formation of its own local authority (in 1996). Previous work on Middlesbrough English (MbE) has demonstrated phonological variation in apparent time in relation to segmental variables (namely, pre-glottalisation of plosives /p t k/) which mirrors these changes in regional identity (Llamas, 2007). In this paper we provide evidence of parallel phonological variation in apparent time with respect to suprasegmental variables (namely, choice and shape of nuclear contour in declaratives and interrogatives). The segmental phonology of MbE is perceptually and phonetically distinct from other urban North-Eastern English varieties (Beal, Burbano-Elizondo, & Llamas, 2012). Although we have good descriptions of the intonation of Newcastle English (Grabe, 2004), the present work arises from the first systematic investigation of the intonational phonology of ME.

Speech data was collected from18 speakers born, raised and living in Middlesbrough: six females aged 18-30, six males aged 18-30, and six females aged 40-60. We elicited a mix of read and semi-spontaneous speech, using stimuli similar to those used in the *Intonational Variation in English* (IViE) corpus (Grabe, 2004) to facilitate comparison. The full corpus comprises scripted sentences elicited via a role play, the Cinderella story read then retold from memory, a map task, and free conversation. Recordings were made in same-sex friendship pairs, directly to digital format using a Marantz PMD661 data recorder and Shure SM10 head-mounted microphones with one speaker per channel. Recording sessions were run by a MbE native speaker research assistant. We report here results from scripted speech tokens of declaratives (*dec*), wh-questions (*whq*) and yes/no-questions (*ynq*); 18 lexical sets x 3 sentence types x 18 speakers = 972; removal of disfluent tokens left 951 for analysis (dec = 306; whq = 323; ynq = 322). Data analysis comprised manual segmentation of the last lexical item in utterances and its internal syllable boundaries, and prosodic annotation using labels from a prototype 'IPrA' tagset (Hualde & Prieto, 2016), based on auditory impression. Time-normalised pitch contour visualisations across tokens are based on F0 measurements extracted in semitones re 100Hz in Praat for 50 time points over whole utterances and 10-20 time points per word/syllable. We plot F0 contours across multiple tokens of parallel utterances in order to provide independent support for generalisations about 'typical' F0 contours observed in the data. We explore distinctiveness of contours across age groups using Generalised Additive Models (GAM) in *ynq* and *dec* respectively (Sóskuthy, 2017).

The results (Fig. 1-2) show older female speakers use a variety of contours, but with many rise-falls, similar to patterns that we observe in York English; the younger speakers pattern more uniformly and show rise-plateau contours similar (though not identical) to those in Newcastle English; the clearest difference between age groups is in declaratives. Sample tokens of declarative utterances are in Fig. 3, with comparison to York/Newcastle contours. The nuclear contour used by younger MbE speakers appears to be a steady rise from the accented syllable to the boundary (L* !H%), which contrasts with descriptions of the Newcastle rise-plateau as L*+H !H% [IViE: L*H %], and is more similar to the 'late rise' described for Liverpool English as L*L-H% (Nance, Kirkham, & Groarke, 2015).

We interpret these findings as evidence of suprasegmental variation in apparent time: older speakers display patterns similar to those found in York intonation, but younger speaker display patterns similar (but not identical) to those in Newcastle intonation, mirroring prior descriptions of segmental variation (Llamas 2007). In our presentation we will additionally report the results of direct comparison to Newcastle data (from the IViE corpus) and York data (arising from data collection in progress).
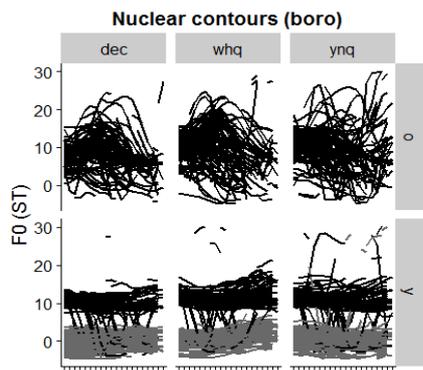
Fig. 1: Time-normalised smoothed F0 contours over last word in all tokens, by sentence type, age (top=old; bottom=young) and sex (dark grey=female; light grey=male).
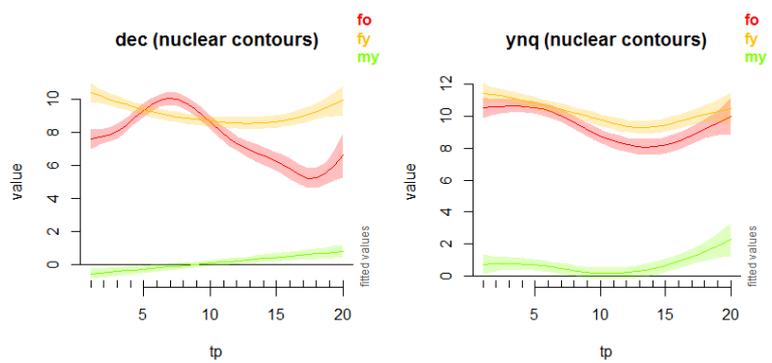
Fig. 2: Predictions of GAM models of the nuclear contour using cubic regression splines (cr) fitted using maximum likelihood estimation (ML) for *dec* and *ynq*, by speaker group (red = older female; yellow = young female; green/bottom = young male).
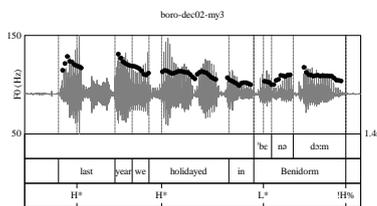
a) Middlesbrough declarative (young male)
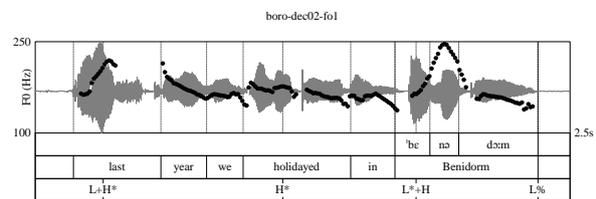
b) Middlesbrough declarative (older female)
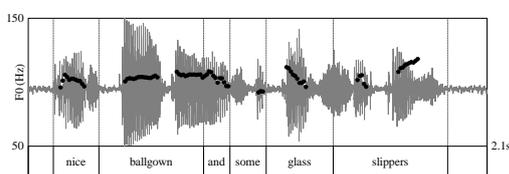
c) Newcastle: rise-plateau on declarative
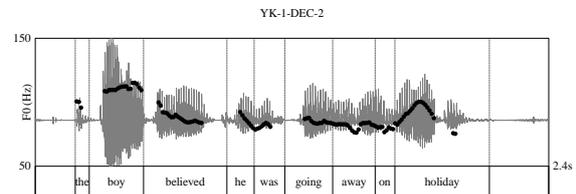
d) York: rise-fall on declarative

Fig. 3: Typical nuclear contours observed in declarative utterances in scripted speech

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