The phonetics and pragmatics of H* and L+H* in British English

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In English intonation, a distinction is often posited between two pitch accents, H* and L+H*: H* is realized as high pitch and encodes new information, while L+H* is realized as rising pitch and used contrastively [1]. However, the distinction is not generally accepted: for instance, [2] argues that L+H* is just an emphatic rendition of H*, not a distinct accentual category. Further, intonation is subject to dialectal variation [3], and descriptions of Southern British English (SBE) intonation, the variety investigated here, usually argue for the presence of only falls, with high falls largely corresponding to L+H* and low falls to H* (e.g., [4]). Based on the above, our aim was twofold: first, to provide empirical evidence regarding the shape of the accents in SBE, and second to test the hypothesis stemming from [1] regarding their function. If H* and L+H* are phonologically distinct, each accent should have a distinct form that should largely correspond to a specific function related to information-structure.

We investigated this hypothesis by examining 2,450 accents elicited from 8 native speakers of SBE producing unscripted speech in 3 tasks: each participant created and narrated three short stories, and pairs of speakers participated in a map task and an informal discussion. We used unscripted speech because it is less controlled than lab speech but reflects more realistically how individual speakers encode information structure relative to lab-elicted scripted speech where speakers are often reminded of intended differences in meaning – either explicitly or implicitly. The data were annotated separately for the phonetic and information-structure dimensions to avoid phonetic classification being guided by pragmatic meaning and vice versa. The phonetic annotation was based on f0 shape only: accents were annotated as L+H* if they included a deliberate f0 dip at the onset of the accented syllable, and as H* otherwise. The pragmatic annotation was based on orthographic transcripts only: items were annotated as corrective if they were an explicit correction of a previously mentioned item, and as contrastive if they were part of an implicit set of alternatives. Next, each item accented with H* or L+H* (based on the phonetic criteria above) received a separate pragmatic label: corrective or contrastive if marked as such in the orthographic transcript, and new otherwise (see Fig. 1). A Generalized Additive Mixed-effects Model (GAMM) fitted the normalized f0 curves of the annotated items using the mgcv [6] and itsadug [7] packages in R [8], with accent (H*, L+H*) and pragmatics (new, contrastive, corrective) as fixed intercepts and smooth terms, and speaker as a factor smooth (random intercept and slope). Functional Principal Component Analysis (FPCA; [5]) was used to normalize for time (using the onset of the accented vowel as a temporal landmark), and for speaker.

The smooth curves in Fig. 2A showed that both accentual falls (H*s) and rise-falls (L+H*s) were attested in these SBE unscripted data. The range of significant difference between the two accentual curves (line a) included the accented vowel, which is expected to carry the bulk of the difference between the two accents. On the other hand, the difference between the pragmatic conditions (Fig. 2B) was significant only between new and corrective items for a range that included the accented vowel (line b), but not between new and contrastive, or between contrastive and corrective (for which the difference was significant but for a range not inclusive of the accented vowel; line c). The lack of clear delineation between the F0 curves of new vs. contrastive items, and between contrastive vs. corrective items indicates that the information-structure based distinction between H* and L+H* posited by [1] for American English does not hold for SBE. This could be a variety-specific difference, but it also raises the possibility that there are several degrees of contrastivity [cf. 9, 10] than previously assumed in intonational studies, where the distinction between new vs. contrastive information is often seen as binary. Further, our data indicate that in SBE, L+H* is also used to mark unexpectedness (Fig. 1), and intensify the meaning of items such as really, as well etc.: an additional indication that the function of L+H* is not exclusively related to information structure.

In conclusion, by separating the shape-based and meaning-based annotation procedures, the current study showed that H* and L+H* are distinct in SBE in terms of f0 shape but the two shapes do not map one-to-one with information-structure. Moreover, our findings underline the importance of using different types of speaking tasks, a practice that allows for the observation of greater variation of f0 shape and accent function in discourse. Lastly, the data-driven approach taken in the current analysis can be applied to other types of contrasts lacking clear evidence for a phonological distinction.
Figure 1: A sample utterance from the storytelling task showing the phonetic and pragmatic annotation tiers.

<table>
<thead>
<tr>
<th>It</th>
<th>was</th>
<th>Rapunzel!</th>
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<tbody>
<tr>
<td>L+H*</td>
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Figures A and B show: (A) two accent smooths (marked with red vertical lines) between 133 – 439 ms (line a), and three pragmatics smooths (right) with the range of significant difference between 0 – 249 ms for new vs. corrective accents (line b) and 0 – 58 ms for contrastive vs. corrective accents (line c). The gray vertical lines indicate the onset of the accented vowel.

References