The Communicative Function of High Rising Tunes in Australian English

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Aims of the current study

Part One

•To clearly establish the phonetic nature of High Rising Tunes (HRTs), specifically whether or not the low (L*) and high (H*) pitch accent onsets of HRTs, earlier established as a feature of AusE (Fletcher & Harrington, 2001), represented different categories.

Part Two

•To confirm the broad communicative function of both statement and question HRTs in AusE in relation to earlier descriptions (e.g. Horvath, 1985; Guy *et al*., 1986; Fletcher *et al*., 2002).

•To establish the specific communicative function of the L* and H* pitch accent onsets of AusE HRTs.

Part One
A phonetic definition of HRTs

HRTs with L* and H* onsets are labeled as follows: (based on the same transcription conventions as ToBI, Beckman & Ayers-Elam, 1994)

- **Low** onset HRTs are labeled as:
  '..and we were at the **beach,'** L* H-H%
  'Are you afraid of ***sharks****?'* L* H-H%
- **High** onset HRTs are labeled as:
  '..and there was this ***shark*** *alarm,'* H* H-H%
  '*Can you* ***swim****?'* H* H-H%

Use of both L* and H* onset HRTs in AusE Map Tasks

- Fletcher & Harrington (2001): **adult** speakers used a majority of L* onset HRTs for statements and H* onset HRTs for questions.
- McGregor (2006, unpub.PhD): **adolescent** speakers -

  8 **females** used majority of L* onset HRTs for statements (56%) and H* onset HRTs for questions (67%).

  6 **males** used majority of H* onsets for both statements (63%) and questions (71%).

(Data from McGregor, 2006 was used for the phonetic study).

Phonetic Analysis

Method: speakers

•A corpus of 14 (8 female and 6 male) adolescent speakers of AusE (McGregor, 2006).

•Speakers were selected to control for the variables of age (14-17 years), gender and socioeconomic grouping, and were all speakers of the General variety of AusE.

Materials: The Map task (Millar *et al.*, 1994)

•A co-operative speaking task involving 2 participants (Leader + Follower) whose goal is to guide or follow one's partner around a 'treasure' style map (McGregor, 2006).

•The maps depict the line drawings of several landmarks.

•Leaders & Followers have slightly different maps.

•Only the Leader's map has a route marked on it.

The Data

•Speakers were recorded in same-sex dyads (McGregor, 2006).

•Speakers were recorded in an acoustically treated studio, on separate microphones.

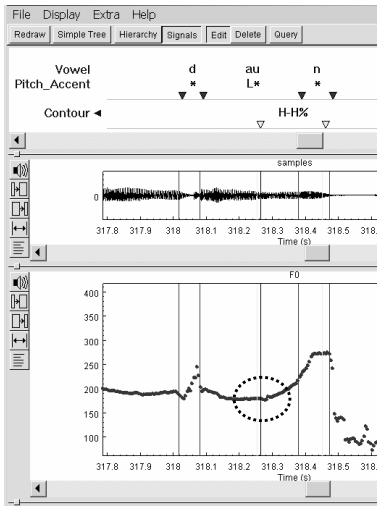
•Recordings were digitised for analysis (females: 20 kHz; males:16kHz).

•Speech samples and F0 tracks were extracted using esps/Xwaves, and analysed in EMU (Cassidy & Harrington, 2001).

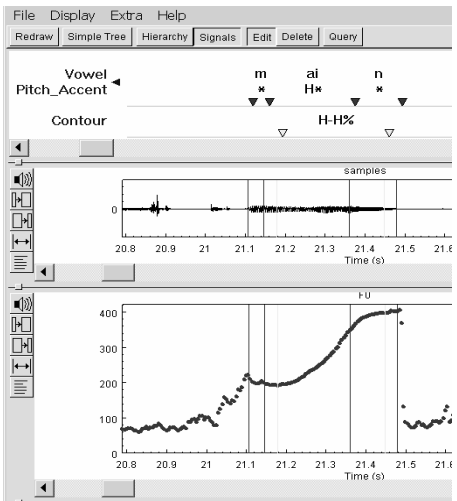
Status of the L* and H* pitch accent onsets

- We investigated whether or not the L* and H* onsets in the HRTs in this data set (McGregor, 2006), represented different categories (Pierrehumbert, 1980), or whether the phonetic evidence pointed to the location of the L* and H* onsets at different ends of an F0 continuum.

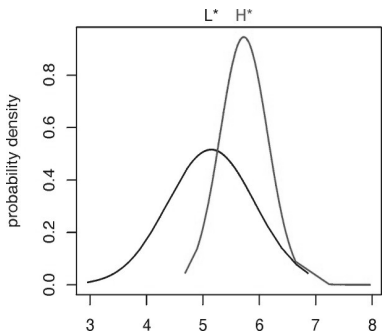
L* pitch onset



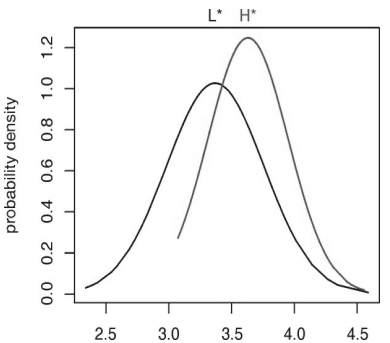
H* pitch onset



Distribution of H* & L* Pitch Accents

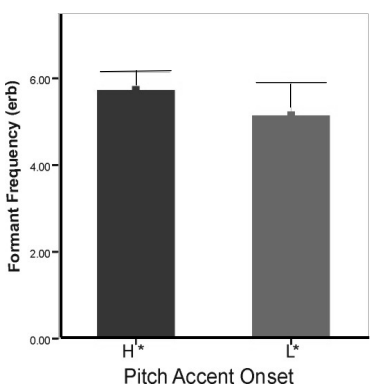


Female

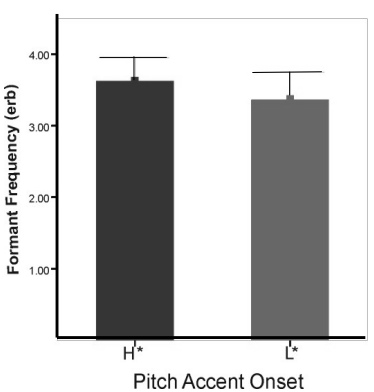


Male

H* & L* Pitch at Contour Onset



Female



Male

Statistics

Mixed model ANOVA with Speaker as a random factor and Pitch (H*/ L*) as a fixed factor

Pitch Onset (frequency in erb):
Female: $F(1,463.21)=148.66$, $p < .000$
Male: $F(1,390.25)=70.16$, $p < .000$

Speaker: always non-significant

Part Two
A semantic definition of HRTs

- **Question HRTs** question the propositional content of the phrase, and seek a yes/no response from the listener:

  *'Are there any sharks in Auckland **Harbour**?'*

  *'There are **sharks** in Auckland Harbour ?'*
- **Statement HRTs** do not question the propositional content of the phrase, but appear to question the listener's understanding of the proposition:

  *'Well, we went down to the **beach**, to catch a few **waves**, and there was this **shark** alarm…'*

Method

•For the current study, we selected a sub-set (2 female and 2 male speakers) from the Map Task corpus of 14 (8 female and 6 male) adolescent speakers of AusE (McGregor, 2006).

•We carried out an intonation analysis, and 2 different types of discourse analysis on this data, in order to account for both the broad and the narrow communicative functions of HRTs.

Intonation analysis

- Purpose to compare the broad range of nuclear tunes, and establish the frequency of specific tunes.
- An auditory analysis was carried out of all the intonation phrases of the Map task dialogues for the 4 speakers, in addition to the HRTs that had been previously labeled using ToBI (McGregor, 2006).
- The auditory analysis was made using the Map task recordings, with reference to the F0 pitch trace on the screen.
- Range of tunes simplified into the following categories: falling, low-rising, complex rising, and high-rising (statement and question).

Discourse analysis 1

HCRC coding scheme (Carletta *et al.*,1996).

- Correspondence between speech act ('move') categories and HRTs used by speakers. *Initiating 'moves' included Instruct, Explain, Align,Clarify, Check, Query (yes/no and WH).*

- Role of listener responses to HRTs.

  Response 'moves' included Acknowledgement (minimal response), Explain, Reply, Clarify and Query.

Discourse analysis 2

Pierrehumbert & Hirschberg's (1990) compositional theory of tune meaning.

- We looked specifically at the speakers' production of L* and H* pitch accents in both statement and question HRTs.

According to the theory:

- **Statements**: lexical items made salient with H* pitch accents are to be treated as 'new'; L* as 'shared' (we glossed this to 'not new').
- **Questions**: H* onsets used in anticipation of a confirmation ('yes') response; L* onsets used to invite the listener to respond by providing the information sought by the speaker.

Results - Intonation analysis

Mean for all 4 adolescent speakers

- falling tunes (41%)
- low continuation rises (29%)
- complex rises (14%)
- statement HRTs (11%)
- question HRTs (5%)

Results - HCRC coding scheme 'move' analysis

Initiations

- **Statements** – majority of L* and H* HRTs corresponded with the Instruct category.
- **Questions** - majority of L* and H* HRTs corresponded with the yes/no Query category.

Responses

- **Statements** - majority of L* and H* HRTs were followed by minimal responses, or no verbal response (speaker held the turn).
- **Questions** - majority of L* and H* HRTs were followed by yes/no responses.

Results - Pierrehumbert & Hirschberg's tune theory

Statements:

- Majority of H* onset HRTs were associated with 'new' information.
- Majority of L* onset HRTs were associated with 'not new' information.

Questions:

- Majority of H* onset HRTs, speakers anticipated a confirmation ('yes') response (information recoverable from dialogues by the speaker).
- Majority of L* onset HRTs, speakers anticipated that listener would provide the information they sought (information only recoverable by the listener).

Conclusions

- **Intonation analysis** showed that the frequency of use of statement HRTs has increased since the earlier studies of Horvath, 1985 (1.6%) and Guy *et al.*, 1986 (2.6%).
- **HCRC analysis** (speaker contributions) showed that HRTs played a crucial role in the management of the Map task: statement HRTs to provide information, and question HRTs to query or check information.
- HCRC analysis of the **listener responses** confirmed the collaborative role of HRTs in interactive discourse.
- **P & H analysis** established that the phonetic realisational differences of HRTs are associated with different discourse functions.
- **Finally**, we propose that it is crucial to investigate intonational meaning within the context of the unfolding discourse.

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