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**

**H* & L* Pitch at Contour Onset**

**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.

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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%)

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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.

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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.