Compound rises and “uptalk” in spoken English dialogues

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Abstract

“Uptalk” or the use of rising and high pitch at the end of statements is common in interactive discourse in Australian English. The distribution and discourse functions of complex and compound rising tunes were examined in a corpus of Australian English map task dialogues. Each utterance was analysed in terms of Dialogue acts (classified using DAMSL) and intonational tune. It was found that most terminal high rises were in fact part of split or compound fall-rises, and are not the same as yes/no question rises in English. There was also a strong correspondence between pitch range of the terminal elements and discourse function. For example, forward-looking communicative acts (e.g. those that influenced the upcoming discourse) usually corresponded to complex and compound fall rises that terminated at a high pitch level, whereas low range fall-rises (both complex and compound) were more likely to terminate backwards looking dialogue acts, i.e. those acts that referred to what had previously occurred in the discourse. These results support earlier claims that rising pitch in Australian English is used as a cooperative device in complex interactions. They further suggest that the entire tune of the intonational constituent needs to be taken into account, and not just the terminal element.

1. Introduction

In recent years the term “uptalk” has been used to reflect the characteristic rising intonation that is associated with the end of statements in English spoken in Australia, New Zealand, Canada, and in certain southern urban dialects of British English. For example, statements in Australian English are sometimes realized with a simple terminal high rise [1] that is usually associated with yes/no questions in other varieties of English. However, initial impressions suggest that “uptalk” is not always the same as “questioning” intonation in Australian English. As in other languages like Dutch (e.g. [2]), a typical yes/no question is not only signaled by the extent of the terminal rise, but may also be indicated by modifying other intonational features such as suspension of pitch topline downtrends, and a sustained high pitch key for the entire intonational phrase, although this is yet to be experimentally verified. Moreover, an earlier study [3] showed that other kinds of intonational tunes besides simple high terminal rises, e.g. the fall-rise tune, can be indicative of statement “uptalk”. Clearly, accurate modeling these features is desirable for both speech input and output systems for Australian English, as well as having general relevance to the modeling of intonation and discourse in this variety.

Traditional accounts of English intonation, whether based on Mainstream American English (MAE), or Standard Southern British English – SSBE- (e.g. [4], [5]), posit two variants of this complex tune, commonly found in spoken interaction: a “standard” fall-rise tune that is aligned relatively late in an intonational phrase, and a so-called “split” fall-rise that is spread across an entire intonational phrase. In Australian English, there are two potential realizations of the standard fall-rise. These are schematized in Figure 1.

![Figure 1: Fall-rise tunes in Australian English.](image.png)

Both may be categorized as Tone 2 in Halliday’s scheme [6]. English intonation manuals describe the standard fall-rise as a tune that starts relatively high, then falls and rises again to around mid-level in a speaker’s range. The second variant, which we have described elsewhere as the “expanded range” fall-rise is characterized by a sharp fall followed by a final rise which terminates relatively high in a speaker’s range, extending often well beyond the pitch level at the beginning of the tune. This part of the tune is very similar in form to simple statement rises that are often used by speakers of Australian English instead of statement final falls, particularly in certain kinds of interactive discourse. The kinds of functions that have been attributed to fall-rises in SSBE and MAE include a wide range of attitudinal and semantic nuances like “incompletion”, “up-in-the-airness”, “doubtful”, “encouraging”, “forcefully reproachful”, and “continuative” [6]. Other interpretations include “polite softening”[7] or it is claimed that the fall-rise emphasises the “cooperative” nature of interaction [8].

In a previous dialogue act analysis of statement rises in MAP task dialogues [9], it was found that speakers use uptalk (i.e. simple statement high rises, and “expanded” range fall-rises) when giving instructions, as a checking device, and as a floor holding device. There was a striking similarity between the kinds of dialogue act correspondences between simple high-rises and expanded range fall-rises. Moreover, there was also a link between these results, and earlier less formal interpretations of the fall-rise tune, particularly the “continuative”, and/or “cooperative” functions. In the earlier studies, MAP task instruction givers, tended to use more uptalk than instruction followers, and it was noted that low
rises were used less frequently, and tended to be associated with dialogue acts such as acknowledgement and agreement dialogue acts.

The aims of the current study were to re-examine uptalk by focusing on non-terminal as well as terminal elements of intonational phrases. The specific research questions addressed in this study are listed below:

Are statement terminal high rises generally part of a compound or “split” fall-rise sequence?

• What kinds of dialogue acts correspond to “split” fall-rises in Australian English?
• Are split fall-rises associated with similar kinds of dialogue acts to fall-rise tunes?

2. Method and Materials

2.1 The ANDOSL Map Task

Four dialogues from the Australian Map Task section of the Australian National Database (ANDOSL) [10] formed the corpus for this study. The dialogues were chosen randomly and the speakers all belonged to the general Australian English dialectal grouping. The dialogues were between 485.93 sec and 810.24 sec in duration. These dialogues were different from the ones analysed in previous studies [e.g. 9].

2.2 Word and prosodic labeling

The acoustic waveform files and F0 signals for the four dialogues were annotated according to ToBI (Tones and Break Indices) conventions that have been adapted for Australian English [9]. Word boundaries were identified and orthographically annotated. Major pitch movements corresponding to pitch accents and intermediate and intonational phrase boundaries were labelled using the F0 signal and auditory analysis. The specific tone sequences under investigation are summarized below.

Split fall-rises
• contours that terminate with a low rise: H* L*/H* L-H%
• contours that terminate with an expanded-range rise: H* L*/H* H-H% - shown in figure 2.

(In both cases: Halliday’s Tone 1/5 followed by Tone 3)

”Normal” fall-rises
• H* L-H% and H*+L H-H%

(Halliday’s tone 2)

The “normal” fall-rise tune is a nuclear tone, with the pitch accent being realized on the nuclear accented syllable and the rest of the tune being realized on any post nuclear material. The “split” fall-rise consists of a “split” nuclear tone with the falling part being realized earlier in the intonational constituent and the rise terminating the constituent. In the British intonation models, the rise is of lesser pragmatic importance than the fall.

2.3 Micro-level discourse coding: dialogue acts

The coding for dialogue acts used in this study was based on the modified DRI/DAMSL scheme used in an earlier study [11]. The dialogue act coding system adopted in that study, SWBD-DAMSL [12], was used because it permits a relatively fine-grained analysis of different dialogue acts beyond the informal semantic categorization of the high rising tune that has been carried out in earlier studies of Australian English.

Table 1 summarizes some of the main “forward” and “backward” communicative functions that the dialogues were coded for. Discourse coding was performed independently of intonational and prosodic labeling. The different rising tunes were categorized according to dialogue act, and Chi-square analyses performed.

Table 1. Some of the major SWBD/DAMSL codes for forward and backward communicative functions

<table>
<thead>
<tr>
<th>Forward-Communicative-functions</th>
<th>Backward-Communicative-functions</th>
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<tbody>
<tr>
<td>Statement</td>
<td>Agreement</td>
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<tr>
<td>sd</td>
<td>a</td>
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<tr>
<td>Influencing-addresser-future-action</td>
<td>Understanding</td>
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<td>Information requests</td>
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<td>(information requests)</td>
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<td>action-directives</td>
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3. Results

The corpus consisted 766 annotated intonational phrases, of which 195 terminated in high rises, and 132 terminated in low rises. Mid-level and final falling tunes made up the rest of the boundary configurations. The high rises could be further divided into those with a low onset (i.e. 115 L* H-H% contours) and those that had a high pitch onset (i.e. 80 H* H-H% contours). Figure 3 shows the distribution of the high rises, plotted according to whether they are part of a split fall-
rise or not. These were always high rises that started from a low point in the speakers’ pitch range. There was no significant effect of gender on rise distribution (p>0.05) so the data were pooled across speakers, but sorted according to participant role in the map task. As mentioned in the introduction, earlier studies showed that this was a factor in determining rise distribution.

There was a significant effect of participant role on the distribution of high rises that were part of split fall-rises ($\chi^2=29.31, p=0.0001$). Instruction givers were more likely to produce more high rises overall, and these rises were more likely to be part of a split fall-rise, than not. In other words of the 58 low onset-high rises produced by Instruction Givers, 48 of these were actually the rise portion of split fall-rises. Instruction followers produced fewer rises than instruction givers in general, and the trend was reversed. Of the 39 low onset high rises produced by Instruction followers, only 10 were part of a split fall-rise. This was also apparent in Figure 4, which plots the distribution of low rises according to whether they are part of a split fall-rise. Instruction givers were more likely to produce low rises that were part of split fall-rises than simple low rises. The situation was once again reversed for instruction followers ($\chi^2=30.54, p=0.0001$) who produced more simple rises.

With respect to the functions of these rises, the effect of participant role was strongly evident in the distribution of forward-looking and backward-looking dialogue acts. Instruction givers produced more rises associated with forward-looking dialogue acts, which included making statements about the map, issuing instructions to the IF, and asking questions about particular landmarks on the map, and fewer rises corresponding to backward-looking dialogue acts ($\chi^2=101.13, p=0.0001$). There was a significant difference in rise type / dialogue act correspondence ($\chi^2=4.23, p=0.05$) with more split fall-rises being used for forward-looking dialogue acts than simple rises, irrespective of the range of the rise. However, IGs were more likely to conclude backward-looking dialogue acts with simple low rises.

Instruction followers produced more rises that terminated backward-looking dialogue acts, than rises that terminated forward-looking dialogue acts ($\chi^2=24.44, p<0.0001$). These acts included those that signaled understanding, acceptance, or rejection of the instruction giver’s statements or instructions with respect to the map task. By far the largest correspondence was between simple low rises and backward looking functions, as with IGs. The next main correspondence was between forward-looking acts and split-fall-rises that terminated with a low rise. The former included dialogue acts such as statements, yes-no questions, and some wh-questions.

![Figure 3](image1.png)

**Figure 3.** Number of (simple) high rises that were part of a split-fall-rise, compared to overall number of high rises.

Figure 5 plots the dialogue act / rise correspondence between split fall-rises and “normal” late focus fall-rises. There was a clear relationship between the two in terms of dialogue act correspondence, particularly for instruction givers. A similar proportion of low range to expanded range fall-rises, and split fall-rises were associated with forward-looking dialogue acts that correspond to instruction giving. In other words, the same kinds of dialog acts were used with both the nuclear fall-rise and the split-fall-rise. Strikingly, very few expanded range raises were used with backward-looking discourse functions, like acknowledgements or agreements. A similar pattern was apparent for instruction followers. More backward-looking functions were associated with both kinds of low range fall-rises (nuclear and split), with only a handful of backward-looking functions being associated with high range rises of either type.

4. Discussion

In this study, it was found that speakers used a lot of terminal high rises with dialogue acts that often corresponded to statements of various kinds, supporting earlier findings [e.g. 9]. It was also found that many of the terminal high and low rises used by speakers were actually part of “split” fall-rises,
in other words, the terminal rise was part of a divided nuclear tone that was realized across the entire intonational phrase. This was most evident for instruction givers in the map task. As found in earlier studies, instruction followers used fewer high rising tunes than instruction givers, and this also corresponded to the greater use of backward-looking dialogue acts by these speakers. Recall that the map task is a ‘cooperative’ and ‘collaborative’ task and it follows from this and earlier analyses of uptalk, that terminal high rises that are part of a split fall-rise or standard nuclear fall-rise share the traditional functions of fall-rises as described in earlier work on intonation. That is, the ‘continuative’ as well as ‘encouraging’ semantic nuances generally attached to fall-rises in English, are also apparent in the map task interactions observed in this study.

Previous research has almost always focused on the terminal intonational element of nuclear high rising tunes [e.g. 1, 3,9]. The results of this study show that the entire tune needs to be factored in when considering the discourse and pragmatic functions of uptalk. It also highlights the need to look at intonation from the point of view of dialogue interaction. Different tunes are used by instruction givers and instruction followers. Whilst representative of “quasi-spontaneous” speech, the tunes used by the different speakers in this corpus are typical of general Australian English. As a result, these results also have implications for current models of speech input and output systems in Australian English. Whilst the intonation system shares many features with other varieties of English, tune usage and tune interpretation are clearly variety-specific.

This study also shows the benefits of adopting two separate annotational and analytical devices when analyzing the discourse functions of intonation. The DAMSL dialog-act schema was applied independently from the intonational analysis to permit a more rigorous assessment of intonational function. Future work will examine the global characteristics of y-questions, taking into account the tune and pitch range characteristics of the entire intonational phrase, and not just the terminal rise.

5. Acknowledgements

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6. References