

Patterns of rising and falling in Australian English

Janet Fletcher and Deborah Loakes

School of Languages and Linguistics
University of Melbourne, Australia
{janetf; dloakes}@unimelb.edu.au

Abstract

The conversational speech of seventeen Australian English-speaking female adolescents was analysed to examine intonational variation in turn-internal and turn-final contexts in spontaneous talk-in-interaction. Between 69-72% of all intonational contours analysed in the corpus had final rises, although only a small proportion of these tunes were examples of uptalk, i.e. high rising terminals associated with syntactic declarative utterances. Whilst a variety of tunes were found in turn-final contexts, speakers tended to use mid-level plateaus, high rises, and fall-rises as floor-holders, whereas more final falls coincided with turn-yielding position. There were minimal differences in the spread of intonational patterns across the city and country corpora, although country speakers used marginally more uptalk than city speakers.

1. Introduction

Australian English, like New Zealand English, Belfast English or Glaswegian English is considered by many to be a 'rising variety' (e.g. Cruttenden 1997; Ladd 1996). In other words, non-questioning syntactic declarative utterances sometimes terminate with high rising intonation. In recent years the term 'uptalk' has been used to refer to this type of intonational feature. As suggested by Warren (2005), the attention that uptalk receives is perhaps not warranted when one considers that in New Zealand English at least, it is not that prevalent, accounting for less than 2% of intonational contours in older speakers, but more than 8% in younger speakers (after Britain 1992). In the Australian context, the interest in uptalk as a feature of Australian intonation persists, largely because it is perceived in the community to be a prevalent feature of spoken discourse.

Within the group of rising varieties, the actual phonetic realization of statement rises varies somewhat. For example, Warren and colleagues observe a degree of variation in the ways that statement high rises are phonetically realized in New Zealand English (see Warren 2005 for a summary of this research). The final rise may begin very late in the nuclear accented syllable, or its onset may be realized relatively early in the nuclear accented word depending on the phonetic and phonological structure of the latter. In recent work on Australian English, Fletcher and Harrington (2001), Fletcher et al. (2002) and McGregor (2006) show that statement high rises may commence with relatively high or low pitch onsets in or around the nuclear accented syllable. Fletcher (2005) also observes that the turning point of the rising portion of expanded range fall-rises, can occur very late in a nuclear accented word that is also intonational phrase-final, resulting in a very rapid final rise, although this remains to be verified experimentally.

To date, we have focused our interest on the range of tunes that might be indicative of uptalk in Australian English. These

can include simple high rises, expanded range fall-rises or rise-fall-rises, and compound or split fall-rises (e.g. Fletcher & Harrington 2001, Fletcher et al. 2002, Fletcher 2005). For example, in a recent analysis of a map task dialogs (Fletcher 2005), it was shown that approximately 50% of the instances of low onset high rises (i.e. rises that commence from a relatively low point in a speaker's range) were found to be part of a split or compound fall-rise tune, suggesting that it is important to focus on all kinds of nuclear tunes: simple, complex and compound when looking at the use of rising intonation in the context of interactive discourse in Australian English.

However to fully appreciate the extent of uptalk in spoken Australian English discourse, it is important to intonational variation in general. With this in mind, all intonational tunes were analysed in the Fletcher (2005) study to gauge the frequency of high rises relative to other tunes, such as falls, low-rises and so forth. Approximately a quarter of nuclear tunes were instances of uptalk, suggesting that a variety of tunes (i.e. rising and falling) are used in the map task interactions. Nevertheless, the proportion of statement high rises was relatively high compared to published data for other 'rising' varieties like New Zealand English (see above). However, the map task is a particular kind of structured talk-in-interaction that is designed to elicit instructions, information requests, 'checking' utterances, back channels and so on.; all of which are conducive to the kind of collaborative talk that potentially encourages the use of uptalk (Fletcher et al. 2002, McGregor 2006, Warren 2005).

Since the 'eighties, the broad discourse functions of uptalk have been examined in light of prevailing models of spoken interaction. In earlier studies of Australian English intonation by Horvath (1985), Allen (1984), and Guy and Vonwiller (1989), it was suggested that uptalk is often used in floor-holding contexts. This was also found to be the case in a later map-task based study (Fletcher et al. 2002) which showed that 56% of simple high rises were floor-holding. The proportion increases to 68% when expanded-range complex rises are

included in the analysis. A parallel dialog act analysis was also carried out on the same corpus (after Allen and Core 1997) and it was found that high rising tunes (i.e. those terminating with a H-H% or an expanded range L-H% configuration) tend to be associated with forward-looking communicative functions (i.e. acts that influence the upcoming discourse or how the current utterance 'constrains the beliefs and actions of the participants, and affects the discourse', Allen and Core, p.4), rather than backwards-looking functions (i.e. how the current utterance 'relates to the previous discourse', Allen & Core, p.4). This is particularly the case when map task participants are performing the instruction giver role where they tend to use more forward-looking dialog acts ranging from yes/no questions (not surprisingly), to statement and opinion communicative acts. Similarly, McGregor (2006) also found that high rises (H-H%) express 'forward directionality' in map task interactions. However, it still remains to be seen how the full range of tune options in Australian English pattern in relation to these types of broad discourse functions in spontaneous talk-in-interaction.

None of the findings reported so far conflict with earlier studies of other varieties of English including Southern British English (e.g. Cruttenden 1997) where a relatively simple tune dichotomy is suggested in relation to overall discourse function, following a more or less universal trend (e.g. Gussenhoven 2004). Rising (and non-falling) tunes are associated with more 'open' meanings, signaling 'discourse incompleteness', whereas falling tunes have a more 'closed' meaning, signaling discourse completion or finality. Horvath (1985) suggests that the open/closed dichotomy proposed for rising versus falling tunes needs to be broadened to take into account an interactional dimension, particularly in relation to uptalk. In other words, statement high rises engage the participation of the hearer in much the same way as a question rise would ordinarily elicit a response from a discourse participant. She suggests that this a way to reconcile earlier analyses of uptalk as 'questioning intonation' in contexts where a syntactic question is not the intended utterance on the part of the speaker.

Other types of rises, or the use of high pitch key in general, can also signal discourse incompleteness, and similarly engage the participation of the listener. Vermillion found that in New Zealand English, boundary tone height (i.e. H% versus L%) rather than a simple rising/falling tune dichotomy is interpreted as a 'speaker-oriented turn cue' response, signaling turn incompleteness/completion. However she also found that H* pitch accents that were realised very high in a speaker's range, as well as a high H% boundary target (i.e. what amounts to a high rise realized in very high pitch key) are interpreted as a 'listener-oriented turn' cue, suggesting a more complex relationship between the tune-type, pitch target and speaker/listener interaction in her New Zealand English data. Vermillion (2006) also discusses work by Wichmann and Caspers (2001) who found that a high plateau-like tune or a shallow fall realized in a relatively high pitch key, are perceived as floor-holders in Southern British English discourse, whereas wide-range falls or rises are interpreted by listeners as floor-yielding.

It is quite apparent from earlier studies of intonation in Australian English, and from our own work that a variety of tunes (rising and falling) occur in spoken discourse. With this in mind, the main aim of the current investigation was to look at intonational patterns and tune usage in general interactive

discourse. In this study, therefore, we chose to focus on free conversation between groups of young adolescents who know each other well, rather than using quasi-spontaneous speech like map tasks. In particular, we wanted to examine the proportion of rising tunes to falling tunes in the conversational discourse in the light of earlier claims by Cruttenden (1997), and Wichmann and Caspers (2001), for example.

One of the key findings in the earlier map task studies is that uptalk is equally present in male and female speech, although there is a large degree of inter-speaker variation, irrespective of speaker sex. In fact McGregor (2006), in her recent study of four map task interactions of Sydney adolescents, found that male participants use slightly more uptalk than female participants. These findings contrast somewhat with previous sociolinguistic work from the '80s (e.g. Guy and Vonwiller 1989) which suggests that uptalk is used primarily by adolescent females. Conversely, they support Horvath's (1985:126) claim that the HRT 'is a change that is moving through the core speech community' in Sydney at least. Warren (2005) also reports that the phenomenon is widespread in younger speakers (male and female) of New Zealand English. We therefore hypothesized that uptalk would be present in the intonational patterns of the young adolescents investigated here.

Our other major goal in this study was to examine Australian English spoken in Melbourne and rural Victoria, Australia, because previous intonational research of this kind has tended to focus on English spoken in the Sydney area. It is not yet clear whether there are any intonational differences between groups in different regional localities, although anecdotal evidence suggests that uptalk may be more of a feature of Australian English as spoken in Sydney or Queensland. The results reported here build on preliminary findings by Fletcher and Loakes (2005).

2. Methods and materials

2.1. Corpus

Recordings from an existing corpus of English spoken in Victoria, Australia were analysed in this study. The corpus was recorded as part of the 'Dimensions of Australian English' project at Monash University, Melbourne. Four sets of conversations between adolescent girls were selected. All speakers belonged to particular friendship groups and were around fifteen years old at the time of recording. Two groups of teenagers (two groups of five and two speakers respectively) resided in the rural western districts of Victoria around Tarrington which is located 300 kilometers to the west of Melbourne. The Melbourne speakers (two groups of five, and five speakers respectively) lived in Mount Waverley in the eastern suburbs of Melbourne. An entire fifteen minute conversation was analysed for each group. We chose to focus our investigation on female rather than male speech, largely for practical reasons. We found there was generally more 'talk' amongst the recordings of the female friendship groups than amongst the male groups. Even so, the distribution of talk was not equal within the female groups, and the Melbourne conversations consisted of relatively more talk than the Tarrington conversations.

2.2. Word and Prosodic Labelling

The original analog recordings were digitized at 22 KHz., and the acoustic waveform files and F0 signal were annotated according to ToBI (Tones and Break Indices) conventions that have been adapted for Australian English (e.g. Fletcher and Harrington 2001). 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 summarised in Table 1. The tunes listed in column 2 of Table 1 are those that are classified as uptalk in Australian English (e.g. Fletcher 2005). These tunes (with the exception of the expanded range fall-rises) have high phrase accents, and full intonational phrases have high phrase accents and high boundary tones. All tunes except those listed in the final column with a L- or L-L% boundary configuration are classified as rises or 'non-falling tunes' in this study, after Pierrehumbert (1980). Whilst the category 'mid-level' assumes a plateau-like tune in the ToBI annotation framework for English (i.e. tunes with a H-L% boundary configuration), this boundary combination can be realized as a level or slightly rising tune in Australian English, and thus can be grouped with the set of rises as originally suggested by Pierrehumbert (1980). In fact it is described as the 'stylized' rise by Ladd (1996).

Table 1 Summary of tunes and associated ToBI annotation categories

	<i>High Rise (Uptalk)</i>	<i>Low Rise</i>	<i>High/Mid-level</i>	<i>Fall</i>
<i>Simple (low pitch onset - nucleus)</i>	L* H-H% L* H-	L*L- H%		
<i>(high pitch onset - nucleus)</i>	(L*)H*H-H% H* H-		H* H-L%	(L+) H* L- L% H* L-
<i>Complex(fall-rise)</i>	H*L-H% (expanded range)	H*L- H%		
<i>Compound</i>	H* L*/!H% H-H%	H* L* /!H* L-H%		

Each tune was also labelled using broad talk-in-interaction criteria, namely position in turn. Tunes were labelled as either turn-internal (i.e. floor-holding) or turn-yielding. Intermediate phrases were always turn-internal except where they coincided with an intonational phrase boundary.

2.3. Micro-level discourse coding: dialog acts

The coding for dialog acts used in this study was based on the modified DRI/DAMSL scheme used in an earlier study (Fletcher et al. 2002). The dialog act coding system SWBD-DAMSL was used because it permits a relatively fine-grained analysis of different dialog acts beyond the informal categorisation of the high rising tune that has been carried out in traditional studies of Australian English intonation. In the current study, dialog act analysis allowed us to analyse a wide range of tune/dialog act correspondences. For example, in earlier studies, the correspondences between different dialog

acts and falling tunes or mid-level or high level tunes was not analysed.

Table 2 summarises some of the main 'forward' and 'backward' communicative functions used in the dialog act coding of the conversations. Once again, 'forward-looking' dialog acts refer to those utterances that relate to the upcoming discourse, whereas 'backward-looking' acts refer to what has already taken place in the discourse. The Tune/dialog act correspondence was coded and Chi-square analyses were conducted to see if there was any relationship between tune-type and turn position, on the one hand, and tune-type and dialog act on the other.

Table 2. Some of the major SWBD/DAMSL codes for forward and backward communicative functions

Forward-communicative-functions	Backward-communicative-functions
<u>Statement</u> <i>sd</i> <i>sv</i> <u>Information requests</u> <i>qy</i> <i>qw</i> <i>ad</i>	<u>Agreement</u> <i>a</i> <i>ar</i> <u>Understanding</u> <i>br</i> <i>b</i> <i>bk</i> <u>Answer</u> <i>ny</i> <i>nn</i>

3. Results

3.1. Tune distribution and position in turn

Table 3 summarises the distribution of major nuclear tunes in the corpus for the Melbourne and Tarrington speakers. Because there was less talk (and more long pauses) in the thirty minutes of recorded conversations amongst the Tarrington speakers, there were fewer full intonational phrases compared to the Melbourne corpus. Conversely turns tended to be longer in one of the Tarrington conversations, and there were relatively more intermediate phrases as a result. There were some obvious similarities in the patterns of tune usage by both groups of adolescent girls. The most prevalent intonational phrase-final tunes in the Melbourne and Tarrington girls' interactions were the mid-level tune (H* H-L%) and final fall (H* L-L%). High rising tunes (irrespective of whether they were yes/no question rises or statement rises) accounted for only 19% of all intonational phrases, with complex rises and low rising tunes making up the balance. Rising tunes accounted for 69% of all tunes in the Melbourne corpus, and 72% in the Tarrington corpus

Figures 1 and 2 show the distribution of rising and falling tunes according to position in the conversational interactions. Both groups of speakers produced a similar proportion of rising and falling tunes in floor-holding and turn-yielding contexts even though there were fewer turn-transitions in the Tarrington corpus (125) compared to the Melbourne corpus (186). The relationship between broad tune-type (i.e. rising or falling) and turn position was significant in both the Melbourne (M) and Tarrington (T) data (Chi-sq=4.452,

$p < 0.03$; Chi-sq=5.19, $p < 0.02$). There were fewer falling tunes overall, and fewer in floor-holding contexts compared to turn-yielding contexts. Conversely more rising tunes served as floor-holders than falling tunes.

A variety of rising tunes served as floor-holders. In both corpora, the mid-level/high level contour (i.e. a tune terminating with a H-L% boundary configuration) was the most frequent floor-holding rise (T: 92; M: 91). The next most frequent floor-holding rise was the high rise, i.e. a tune terminating with a H-H% boundary configuration (T:38; M:48), followed by either the fall-rise or low rise.

Table 3. Distribution of major tunes across Melbourne and Tarrington corpora expressed as proportion of total

Tune	Melbourne n=449	Tarrington n=357
H* H-H%	9%	10%
L* H-H%	10%	9%
L* L-H%	10%	6%
(L+) H*L-H%	8%	13%
H* H-L%	32%	34%
H* L-L%	30%	28%

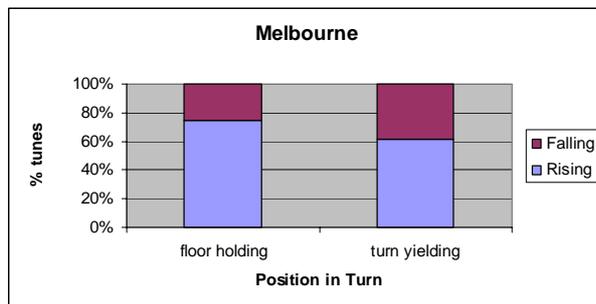


Figure 1. Distribution of rising and falling tunes in Melbourne corpus according to position in turn

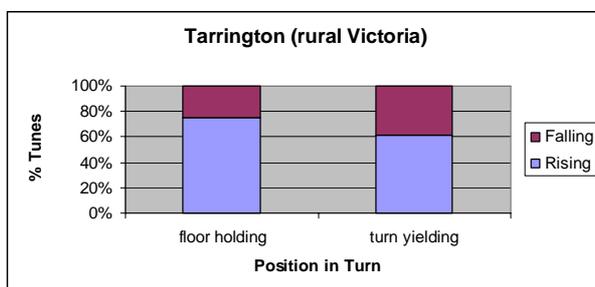


Figure 2. Distribution of rising and falling tunes in Tarrington corpus according to position in turn

Falling tunes (i.e. tunes terminating with a L-L% boundary configuration) also served as floor-holders in both the

Tarrington and Melbourne corpora, although relatively more final falls were associated with turn transition points in the talk-in-interaction.

3.2 Correspondence between tunes and dialog acts

Figures 3 and 4 show the broad tune/dialog act distribution in the Melbourne and Tarrington corpus. In both cases, there was a significant interaction between tune type (falling or rising) and dialog act (Melbourne: Chi-squared = 8.1068, $p < 0.05$; Tarrington: Chi-squared = 10.1041, $p < 0.02$). More forward-looking dialog acts (i.e. statement, opinion, yes/no question dialog acts) tended to conclude with rising or non-falling tunes than falling tunes. There were relatively few backward-looking acts (grouped as 'other' in Figures 3 and 4), than forward-looking acts in the Melbourne and Tarrington interactions. However, there were relatively more 'opinion' acts in the Tarrington conversations than in the Melbourne conversations. These tended to coincide with relatively similar numbers of rising and falling tunes. The topics of conversation were comparable across the corpora, covering school, weekend jobs, favourite television shows, underage drinking and so on.

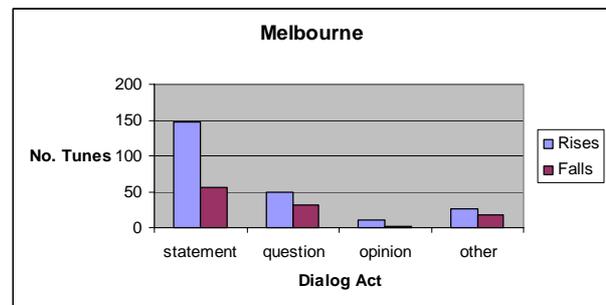


Figure 3. Tune/dialog act interaction in the Melbourne corpus

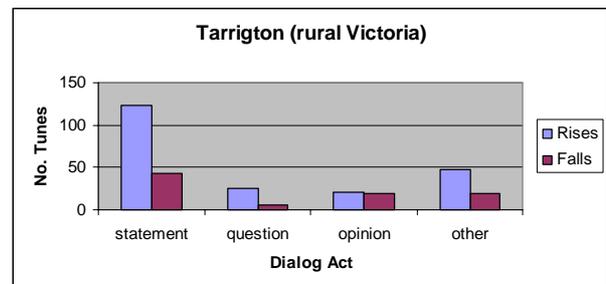


Figure 4. Tune/dialog act interaction in the Tarrington corpus

With respect to the types of tunes that were associated with forward-looking dialog acts, all speakers tended to use mid-level tunes and falls to express opinions and statements, and both low and high rising tunes were used with both statement and yes/no questions. There were very few instances of WH-questions in the two corpora. Both Melbourne and Tarrington speakers used uptalk (i.e. high rising terminals with non-question dialog acts) in their interactions. Around 13% of high rising tunes used by the Tarrington speakers were instances of non-questioning dialog acts, and 11% of high rises in the Melbourne corpus coincided with non-questioning dialog acts. These were usually statement dialog acts, but not opinion acts in the case

of the Melbourne speakers. Almost all high rises associated with non-questioning dialog acts occurred in floor-holding contexts in both corpora.

4. Discussion and conclusions

It is clear that all speakers in the current study used a variety of tunes in their talk-in-interaction. The most frequent intonation patterns observed were not those commonly identified as uptalk. In fact the most common intonational phrase-final tunes were the mid/high-level or sustained high tunes (H* H-L:%) followed the final fall (H* L-L%). Uptalk was present in the teenagers' interactions and there were some marginal differences observed between the Melbourne and Tarrington corpora. Of all tunes produced by speakers, 69% - 72% were rising, although only 13% and 11% of all tunes were examples of uptalk in the Tarrington and Melbourne corpora respectively. Almost all of these statement high rises were turn-internal and floor-holding, although the most common floor-holding tune tended to be mid-level in both data sets.

Based on earlier findings for Australian English (e.g. Allen 1984, Fletcher et al. 2002, Macgregor 2006), it is not surprising to find high rises (or low rises and fall-rises, for that matter) in floor-holding position given the basic continuative or forward-looking discourse functions of these rises in spoken Australian English discourse. The high incidence of mid-level tunes in floor-holding position also confirms preliminary findings reported by Fletcher and Loakes (2005) that this tune functions as a 'floor-holder' in conversational interaction. It is also similar to patterns observed by Wichmann and Caspers (2001) for Southern British English, reported in Vermillion (2006).

Our results for Australian English also provide some support for the relatively simple 'open/closed' dichotomy for rising and falling tunes proposed by Cruttenden (1997). Falling tunes were less prevalent than non-falling tunes in this study, but more falling tunes were found at turn-transition points than in floor-holding contexts. Conversely more rising tunes were found in floor-holding contexts. Our results also partially accord with those reported for New Zealand English (Vermillion 2006), particularly in relation to the high incidence of mid-level or slightly rising tunes (in high key) in floor-holding contexts. However unlike Vermillion's study, ours was based on the production of intonational contours, and a perception study may yield a complex relationship between tune shape, pitch range, and discourse interpretation in Australian English.

The relatively low incidence of uptalk in this corpus compares reasonably well with previous observations of map-task interactions between Australian English-speaking adolescents. McGregor (2006) found that uptalk accounted for about 11% of tunes used by adolescent participants in her discourse study. However there were some differences between the current study and earlier studies. As mentioned in the introduction, Fletcher (2005) found that approximately 19% of all tunes were indicative of uptalk, and that a further 12% of tunes were plateau-like or mid-level, but in the four sets of talk-in-interaction examined in the current study, 32% of tunes were either mid-level or slightly rising (i.e. with a H-L% boundary tune) and there was less uptalk overall. There were also fewer question rises in the conversational talk-in-interaction investigated here, compared to the map task-based

studies. Nevertheless, the proportion of 'uptalk' reported in all recent studies of Australian English is far higher than the 1.6% reported by Horvath (1985), notwithstanding the fact that her corpus was far more extensive and varied than the earlier map task studies, or the conversational data analysed here. Nevertheless, our findings, together with McGregor's results show that uptalk is definitely one feature of the intonation of adolescents in South-Eastern Australia at the very least. However, the overall pattern of tune usage observed in our study suggests a degree of intonational variation, beyond the dominance of the high rising terminal, particularly in spontaneous talk-in-interaction. Indeed, one might go further and speculate that 'uptalk' in the classic sense is perhaps far less important than the mid-level non-falling tune as a signature feature of adolescent conversational talk-in-interaction in young Australian English speakers.

5. Acknowledgements

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6. References

- Allen, K. (1984). The component functions of the HRT contour in Australian declarative sentences. *Australian Journal of Linguistics*, 4: 19-32
- Allen, J. & Core M. (1997). *Draft of DAMSL: Dialog Act Markup in Several Layers*. <http://www.cs.rochester.edu/research/trains/annotation>
- Britain, D. (1992). Linguistic change in intonation: The use of HR terminals in New Zealand English. *Language Variation and Change* 4: 77-104.
- Cruttenden, A. (1997). *Intonation*. Cambridge: Cambridge University Press.
- Fletcher, J. (2005). Compound rises and uptalk. *Interspeech 2005*, 4pp.
- Fletcher, J. & Harrington, J. (2001). High rising terminals and fall-rises in Australian English *Phonetica*, 58(4):215-229.
- Fletcher, J. & Loakes, D. (2005). Uptalk in regional Victorian English. Paper presented at *ALS2005*, Melbourne
- Fletcher, J., Stirling, L., Mushin, I., & Wales, R. (2002). Intonational rises and dialog acts in the Australian English Map Task. *Language and Speech* 45: 229-253
- Gussenhoven C. (2004). *The phonology of Tone and Intonation*. Cambridge: Cambridge University Press
- Guy, G. & Vonwiller, J. (1989). The High Rise Tones in Australian English. In P. Collins & D.Blair, eds. *Australian English*, pp.21-34. St Lucia: University of Queensland Press
- Horvath, B. (1985). *Variation in Australian English*. Cambridge: Cambridge University Press
- Ladd, D.R. (1996). *Intonational Phonology*. Cambridge: CUP

- McGregor, J. (2006). *High rising tunes in Australian English*. Unpublished PhD thesis, Macquarie University.
- Pierrehumbert, J. (1980). *The phonology and phonetics of English intonation*. PhD thesis Massachusetts Institute of Technology, published 1988 by Indiana University Linguistics Club.
- Vermillion, P. (2006). *Aspects of New Zealand English intonation and its meanings*. Unpublished PhD thesis, Victoria University Wellington.
- Warren, P. (2005). Patterns of late rising in New Zealand English: intonational variation or intonational change? *Language Variation and Change* 17: 209-30.
- Wichmann, A. and Caspers, J. (2001). Melodic cues to turn-taking in English: evidence from perception. In J. van Kuppeveldt and R. Smith (eds). *Proceedings of the 2nd SIGdial Workshop on Discourse and Dialogue*, 180-5.