

The Floor is Yours: On the Perception of Final Lengthening and Pitch Contour as Cues for Turn-Taking in British English by Dutch L2 learners of English

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### **Abstract**

The present study investigates the perception of final lengthening and pitch contour as cues in the turn-taking process in British English by Dutch learners of English, and compares it to the perception of these cues by native speakers of English as described in the literature. 11 female and 2 male native speakers of Dutch took part in a perception experiment and completed a self-evaluative questionnaire on turn-taking in conversations. Although participants did not evaluate their overall English turn-taking skills as being notably different from their turn-taking skills in Dutch, they only showed native-like performance in their perception of final lengthening as a cue in the turn-taking process in British English. The participants' interpretation of the different pitch contours in terms of cues for (dis)continuation was remarkably different from the perception of pitch contour by native speakers of English as described in the literature, and emphasizes the need for further research into the role of pitch contour and the influence of formal instruction on the perception of conversationally relevant prosodic aspects in second language learning in general.

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## 1. Introduction

In production, speakers employ several cues to mark the prosodic structure of their speech. In perception, listeners can use these cues to align their production with the spoken contribution of their interlocutors (De Ruiter, Mitterer & Enfield, 2006). Some of the cues speakers employ are especially relevant to the process of turn-taking, in which several interlocutors cooperate to realize a fine-tuned transition between speaking turns of different speakers. In fact, according to Ford and Thompson (1996), the process of turn-taking is supposedly dependent on specific features of the speech signal which allow speakers to project a turn transition before they reach the end of their speaking turn. These subtle features include syntactic cues (Ford & Thompson, 1996), visual cues, and prosodic cues (Schlegoff, 1988; Wennerstrom & Siegel, 2003; cf. Ford, Fox & Thompson, 2003). The present study focuses on the role of two prosodic cues in the process of turn-taking in Dutch and English: final lengthening and pitch shape.

### 1.1. Final lengthening

Final lengthening, i.e. lengthening of pre-boundary segments, is one of the prosodic cues speakers can employ to signal the end of their utterances or (intonational) phrases (Cambier-Langeveld, Nespor & Van Heuven, 1997). Several studies have investigated the role of final lengthening as a means of projecting the end of speaking turns in interaction in English. Cutler and Pearson (1986), for example, found that longer utterances in their study were more likely to be judged turn-final and they suggested that this might reflect an effect of duration which is specific to elements preceding a major boundary between speaking turns (153). This is in line with the findings of a study on British English by Local and Walker (2012), who found that durational lengthening was more often associated with a turn transition than with same-speaker continuation. Although Wightman, Shattuck-Hufnagel, Ostendorf and Price (1992) suggested that duration might not be a dominant cue in marking major boundaries in American English, Gravano and Hirschberg (2009) reported a pre-boundary increase in speaking rate in their corpus of Standard American English (SAE). Their results indicated that pre-boundary elements were generally characterized by a higher speaking rate and shorter duration than elements which did not precede a boundary. Thus, in contrast with Duncan (1972), who hypothesized that lengthening of the final syllable of a turn-final clause signaled turn-yielding,

Gravano and Hirschberg concluded that more final lengthening occurred in turn-holding conditions than in turn-yielding conditions in their corpus of Standard American English. Clearly, as Hjalmarsson (2011) observed, the present findings on the effect of final lengthening as a cue for turn-taking in English are somewhat contradictory.

Several studies indicated that pre-boundary lengthening is also an important (if not sufficient) cue for marking prosodic boundaries in Dutch (cf. de Rooij, 1979). Although Cambier-Langeveld, Nespor and Van Heuven (1997) stated that the distribution of final lengthening in interaction is merely “the result of the human speech mechanism, together with restrictions on the expandability of segments” (p. 931), Cambier-Langeveld (2000) noted that the literature on the domain and function of final lengthening in Dutch has shown a relation between the amount of final lengthening and the depth of the subsequent boundary. In a different study, Cambier-Langeveld (1997) also found that the domain of final lengthening in Dutch generally is the final syllable; the effect of a prosodic boundary on final lengthening decreases in the syllables preceding the final syllable. It is not clear, however, whether between-speaker turn transitions are generally perceived as a major prosodic boundary in Dutch. Although several studies suggested that *within-speaker* prosodic boundaries positively influence the duration of the preceding syllable (e.g. Cambier-Langeveld, 2000; Gussenhoven & Rietveld, 1992), it is not possible to posit a straightforward hypothesis on the potential relation between final lengthening and *between-speaker* prosodic boundaries based on these studies.

## 1.2. Pitch shape

Several studies pointed out that, in addition to final lengthening, pitch contour is also one of the major cues listeners can employ to project the end of a speaking turn (cf. Ford & Thompson, 1996). In their study of prosodic turn-taking cues in British English, Cutler and Pearson (1986) found a clear but complex effect of nuclear pitch contour on the perception of turn transition. Their results suggested that a downstep<sup>1</sup> in the terminal pitch contour generally functions as a turn-yielding cue, while a pitch upstep is generally perceived as a turn-holding cue. A case study by Beattie, Cutler and Pearson (1982) even suggested that the use of falling contours at positions which are not intended as

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<sup>1</sup> Cutler and Pearson (1986) defined a downstepped pitch contour as “a tonic syllable starting significantly lower than the previous syllable” (p. 149) and an upstepped pitch contour as “a tonic syllable which starts on a higher pitch than the previous syllable” (p. 149).

turn-final might mislead listeners and therefore cause to interrupt the original speaker at a turn-medial position. In line with these findings, Chen (2007) observed that British English listeners “associate a higher end pitch with a higher degree of likelihood of continuation” (p. 134). In addition, as suggested by Grover, Jamieson, and Dobrovolsky (1987), non-low final boundary tones are generally more often employed as a turn-holding cue than as a cue for discontinuation in English. This is also true for boundary tones in Dutch (Caspers, 2003).

Furthermore, Chen (2007) offered a language-specific account of which *specific* contours are preferred as a cue for continuation at the end of a clause in perception. She concluded that British English listeners preferred a H\*L H% pitch contour over H\* H% and L\*H H% as a cue for continuation at the end of a clause. Given that Van Donzel (1999) stated that rising and level boundary tones are generally associated with continuation in Dutch, it is not unexpected that Caspers (2003) suggested that the H\* % pitch contour is preferred as a turn-holding cue by speakers of Dutch. When given the choice between three nuclear pitch contours with high boundary tones, however, Dutch listeners preferred a H\* H% pitch contour over H\*L H% and L\*H H% as a cue for continuation at the end of a clause (Chen, 2007). As for turn yielding cues, Vaissière (2008) suggested that H\* % seems to be more indicative of turn keeping than H\* H% in Dutch, while H\* H% might even be ambiguous between turn holding and turn yielding. Clearly, the perception of continuation intonation is a language-specific phenomenon which differs between speakers of British English and Dutch (cf. Chen, 2007).

### **1.3. Perception of prosodic cues by second language learners**

If the perception of continuation intonation or, more generally, the perception of prosodic cues for turn-taking is a language-specific process, then the language-specific perception of prosodic cues for turn-taking is something which should be learned by a second language (L2) learner during the process of L2 learning (Mennen, 2007). Since language-specific aspects of intonational meaning and final lengthening are rarely taught in formal language learning environments, it is not self-evident that L2 learners reach native-like competence in the use of prosodic cues for turn-taking. According to Li and Post (2014), learning the prosody of a second language could be influenced by prosodic aspects of the learners' native language, but universal developmental patterns in the prosody of both L1 and L2

might also play a role. To date, a number of studies have researched the competence of L2 learners in linguistic intonational meaning in perception (e.g. Chen, 2009; Chen, Gussenhoven, & Rietveld, 2004; Grabe, Rosner, García-Albea, & Zhou, 2003). Findings from these studies seemed to suggest that L1 influences perception of L2 intonational meaning to a large extent (Mennen & de Leeuw, 2014).

However, no research has been done into L2 learners' competence in the use of final lengthening as a cue for turn-taking in perception<sup>2</sup>, so it is not clear whether L1 transfer also plays a significant role in perception of final lengthening as a turn-taking cue in L2. The present study therefore aims to investigate the perception of final lengthening as well as nuclear pitch contour (i.e. final pitch accent and boundary tone) as cues in the turn-taking process in British English by Dutch learners of English, and compare it to the perception of these cues by native speakers of English as described in the literature.

#### **1.4. Hypotheses**

Regarding the role of final lengthening in the turn-taking process, it is hypothesized that final lengthening will be associated with turn holding more often than with turn yielding in English. Since it is not clear whether the effect of a major between-speaker prosodic boundary in Dutch is positively associated with final lengthening or not, the hypothesis regarding final lengthening in Dutch is an open hypothesis. Concerning the pitch contour, it is hypothesized that high boundary tones are associated with turn holding more often than with turn yielding. Given that high final boundary tones are more often employed as turn-holding cues than as cues for discontinuation both in English and in Dutch, it is expected that the Dutch learners will show native-like competence in their interpretation of high boundary tones (as opposed to low boundary tones) as a cue for continuation. However, given that H\*L H% has been shown to be a favored within-speaker continuation contour in British English, and assuming that Dutch learners may not have acquired this use of H\*L H%, it is expected that the Dutch participants will fail to show this preference in their interpretation of H\*L H% as opposed to H\*L L% and L\*H H%.

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<sup>2</sup> However, refer to Li & Post (2014) for a study into L2 learners' competence regarding final lengthening in production in general.

## 2. Method

In order to investigate whether L2 learners' perception of final lengthening and nuclear pitch contour as turn-taking cues qualitatively differed from perception of these cues by native speakers of British English, a small-scale perception experiment was conducted; furthermore, participants were asked to evaluate their turn-taking skills in conversations with native speakers of Dutch and English by means of a 16-item questionnaire.

### 2.1. Participants

11 female and 2 male native speakers of Dutch participated in the experiment. All participants were second language learners of English who were enrolled in the bachelor programme *Engelse Taal en Cultuur* at Utrecht University; one student was a first year student of English, 3 students were second year students of English, 8 were third year students of English; also, one fourth year student participated in the study. The students were aged between 19 and 26. A substantial proportion of all participants reported that they also spoke one ( $n = 6$ ), two ( $n = 6$ ) or three ( $n = 1$ ) languages other than Dutch or English. All participants who took part in the perception experiment also completed the abovementioned 16-item questionnaire on their personal experience with turn-taking in conversations.

### 2.2. Materials

60 manipulated sentences were included in the perception experiment. These stimuli were derived from 10 sentences partly adapted from Chen (2007), and read by a male native speaker of British English<sup>3</sup>. All sentences were declarative sentences ending in a monosyllabic or bisyllabic noun ( $n = 6$ ), name ( $n = 2$ ) or adjective ( $n = 2$ ). All sentences followed SVO word order; also, all sentences were characterized by a pre-nuclear pitch accent on the second syllable of the sentence and a nuclear pitch accent on the sentence-final word. The original sound files were saved as separate WAV files and manually manipulated in Praat (version 5.4.08; Boersma & Weenink, 2012). Three pitch contours, H\*L H%, H\*L L% and L\*H H%, were imposed on each sentence after the complete original pitch contour was removed. The schematic contours were imposed on each sentence in a Praat Manipulation Object. The schematic contours H\*L H%, H\*L L% and L\*H H% can be found in Figure 1; Figure 2 displays a screenshot of the Manipulation window in Praat for each contour.

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<sup>3</sup> Refer to Appendix A for an overview of the sentences which were used in the experiment.

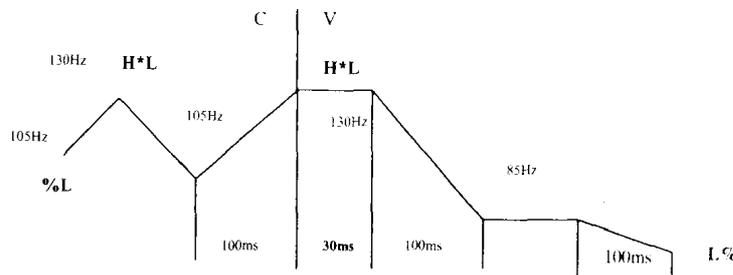


Figure 1a. Schematic representation of H\*L L% (Chen, 2007).

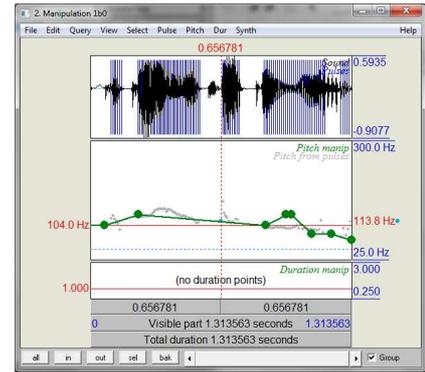


Figure 2a. Praat Manipulation window for H\*L L% (sentence 1).

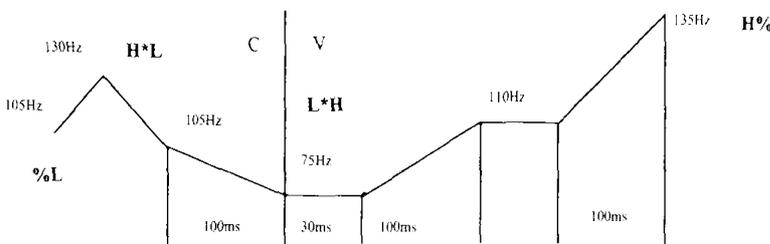


Figure 1b. Schematic representation of L\*H H% (Chen, 2007).

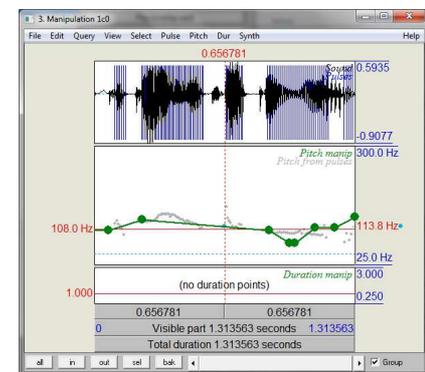


Figure 2b. Praat Manipulation window for L\*H H% (sentence 1).

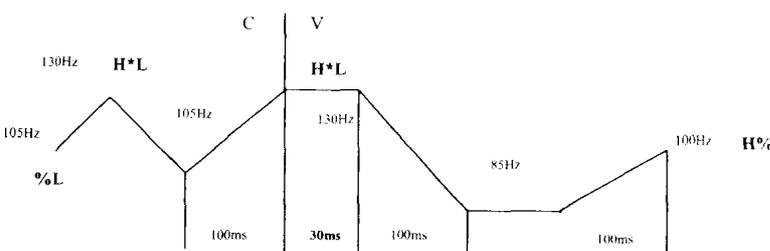


Figure 1c. Schematic representation of H\*L H% (Chen, 2007).

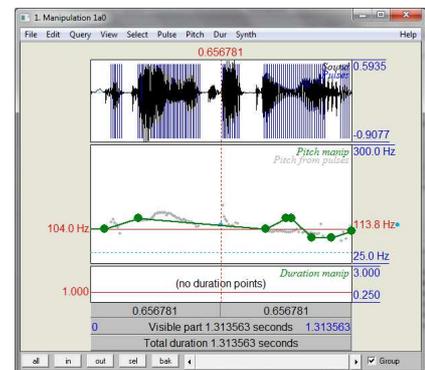


Figure 2c. Praat Manipulation window for H\*L H% (sentence 1).

Two levels of duration were also realized for each sentence by manually manipulating the duration of the final word (cf. Cambier-Langeveld, 1997; Shattuck-Hufnagel & Turk, 1998; Turk & Shattuck-Hufnagel, 2007 for a description of the domain of final lengthening in Dutch and English, respectively). The duration of the final word for each sentence was lengthened by 30 percent of its original duration in one condition (i.e. the final lengthening condition). Again, this was done by means

of a Praat Manipulation object, as is displayed in Figure 3. In all cases, duration manipulation preceded pitch manipulation. Imposing three different pitch contours and two different levels of duration on each sentence resulted in six conditions per sentence (3 contours x 2 lengths).

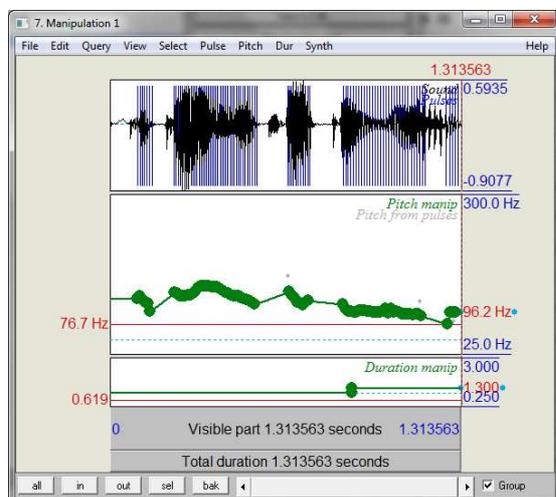


Figure 3. Praat Manipulation window for duration manipulation of sentence 1. Relative duration of the lengthened section is 1.3 (130%).

The questionnaire on personal experience with turn-taking in conversations consisted of 16 statements on the personal experience of participants with turn-taking in conversations. The questionnaire included eight statements on turn-taking in conversations with native speakers of Dutch (Part A) and eight statements on turn-taking in conversations with native speakers of English (Part B). Half of the statements in Part A and Part B were concerned with participants' turn *holding* skills (see 1a and 1b below); the other statements were related to their competence in perceiving and employing turn *yielding* cues (see 2a and 2b below). Part A and Part B contained equal numbers of negatively and positively formulated statements. The statements were presented in the questionnaire in random order. An overview of all statements in the questionnaire can be found in Appendix B.

- 1a. When talking with native speakers of English, I often get interrupted.
- 1b. I never have problems in keeping the floor in conversations with native speakers of Dutch.
- 2a. In conversations with native speakers, I often have difficulty taking my turn to make my voice heard.
- 2b. I never have problems determining when someone is finished with his/her turn and when I can take my turn.

For each statement, participants were asked to indicate the degree to which they agreed with each statement by drawing a cross on a seven-point Likert scale underneath each statement. An example pair of statements and Likert scales is displayed in Figure 4. Participants were additionally asked to fill in a) their name, in order to be able to relate their performance in the experiment to the subjective self-evaluation of their turn-taking skills in the questionnaire; b) their age; c) year of their study (i.e. first, second, third); and d) all languages they speak. Concerning the last question, no requirements were given regarding the minimal level of proficiency.

1. I never have problems in keeping the floor in conversations with native speakers of Dutch.									
Strongly disagree	1	2	3	4	5	6	7	Strongly agree	
2. When talking with native speakers of Dutch, I often get interrupted.									
Strongly disagree	1	2	3	4	5	6	7	Strongly agree	

Figure 4. Example sets of statements and accompanying seven-point Likert scales.

### 2.3. Procedure and data analysis

The listening experiment was preceded by a short practice session with three unrelated British English stimuli. The practice sentences were random sentences retrieved from the Open Speech Repository (n.d.); they were not manipulated. The perception experiment contained 60 stimuli. During the experiment, participants were presented with a random sequence of stimuli and instructed to judge to what extent the sentences sounded turn-final on a seven-point scale (see Figure 4). In the instructions which were presented to participants before they took part in the listening experiment, point 1 on the scale was labelled ‘absolutely not turn-final’ and point 7 was labelled ‘distinctly turn-final’. Participants were told that there was no reaction time limit, and that there would not be a possibility to replay the stimuli. Stimuli were played from an ASUS K50IJ-SX laptop, which was connected to Sennheiser HD 439 headphones. In total, participants took approximately 15 minutes to complete the experiment. All participants completed the questionnaire immediately after the

perception experiment; in general, they spent approximately 5 minutes to complete the survey. All experiments were conducted in quiet rooms at the UiL OTS phonetics lab in Utrecht.

### 3. Statistical analysis and results

In order to evaluate the effect of final lengthening and pitch contour manipulation on turn-taking in the perception experiment, a Linear Mixed Model with Crossed Random Effects analysis was used (Baayen, Davidson, & Bates, 2008). The experimental manipulations of pitch contour (three levels: H\*L H%, L\*H H% and H\*L L%), duration of the sentence-final word (two levels: regular, lengthened) and their interactions were included in the model as fixed effects; participant and item were included as random effects to control for potential between-participant and between-item effects on the response variable. Also, questionnaire score was added to the model as a covariate.

Questionnaire score was computed from the survey data by calculating the mean response for all statements per language per participant. Scores from statements with inverted poles (i.e. when score = 1 represented excellent turn-taking skills and score = 7 represented poor turn-taking skills) were translated into the corresponding target scores (i.e. with 1 = poor turn-taking skills and 7 = excellent turn-taking skills) before the questionnaire scores were analyzed. Cronbach's alpha was used to evaluate internal consistency between statements for each language in the questionnaire.

#### 3.1. Questionnaire scores

Cronbach's alpha was used to evaluate internal consistency between statements within Part A (Dutch) and Part B (English). Cronbach's alpha for the 8-item section on turn-taking in Dutch was .810; for the 8-item section on turn-taking in English, Cronbach's alpha was .876. Since these values were considered adequate for research purposes, mean scores were computed per language section for each participant. Table 1 displays the mean and *SD* of turn-taking scores per language per participant. In order to relate participant's subjective self-evaluation of turn-taking skills in English to their evaluation of turn-taking skills in Dutch, the difference between English ( $M_E$ ) and Dutch ( $M_D$ ) scores per participant was calculated too. This value summarizes participants' self-evaluation of turn-taking skills in English relative to Dutch; it is also displayed in Table 1 (next page) and included in the Linear Mixed Model for further analysis. The overall mean questionnaire score  $M_E - M_D$  was .250 ( $n = 13$ ,

$SD = 1.286$ ), indicating that the average mean questionnaire score for English was slightly higher than the average mean questionnaire score for Dutch.

Table 1

Mean and standard deviation of questionnaire scores per participant per language, and total questionnaire score ( $M_E - M_D$ ) per participant.

Participant	Language	M	SD	Score ( $M_E - M_D$ )
1	English	4.50	1.414	-2.13
	Dutch	6.63	0.460	
2	English	3.38	0.916	.38
	Dutch	3.00	0.926	
3	English	4.00	1.309	.75
	Dutch	3.25	1.282	
4	English	5.75	0.463	.63
	Dutch	5.13	1.126	
5	English	5.13	1.246	1.25
	Dutch	3.88	1.727	
6	English	2.88	1.458	-.75
	Dutch	3.63	1.768	
7	English	5.63	0.268	.63
	Dutch	5.00	0.756	
8	English	4.50	1.195	.50
	Dutch	4.00	1.773	
9	English	5.63	0.518	.50
	Dutch	5.13	1.356	
10	English	4.63	0.916	.63
	Dutch	4.00	1.414	
11	English	4.00	1.069	-.63
	Dutch	4.63	1.188	
12	English	6.13	0.641	3.00
	Dutch	3.13	2.167	
13	English	3.50	1.414	-1.50
	Dutch	5.00	1.690	

### 3.2. Lengthening and pitch contours

In order to investigate the quality of the effects of final lengthening and pitch contour on the perception of turn-taking, mean values for each variable were measured over all participants. The mean response for lengthened stimuli was 3.67 ( $n = 390$ ,  $SD = 2.00$ ); for non-lengthened stimuli, mean response was 4.30 ( $n = 390$ ,  $SD = 2.13$ ). The mean responses per pitch contour were 4.37 ( $n = 260$ ,  $SD = 2.05$ ) for contour H\*L H%, 4.38 ( $n = 260$ ,  $SD = 1.95$ ) for contour H\*L L%, and 3.20 ( $n = 260$ ,  $SD =$

2.04) for contour L\*H H%. Figures 1 and 2 illustrate the minimum, maximum, and mean response values per length and per pitch contour, respectively.

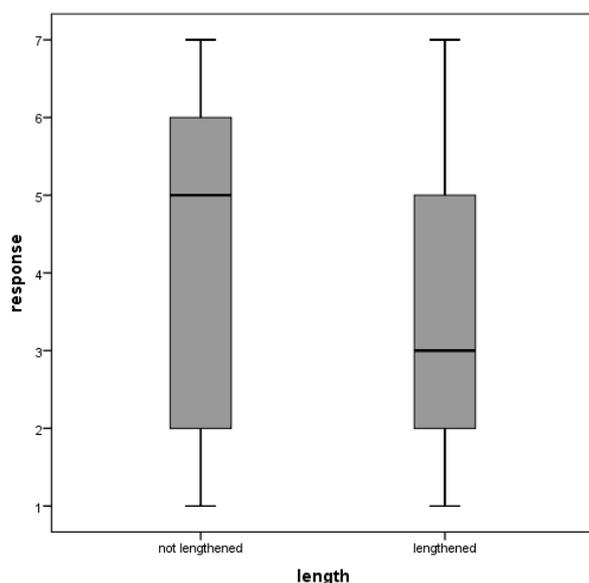


Figure 1. Boxplot of responses in the perception experiment for lengthened versus non-lengthened stimuli.

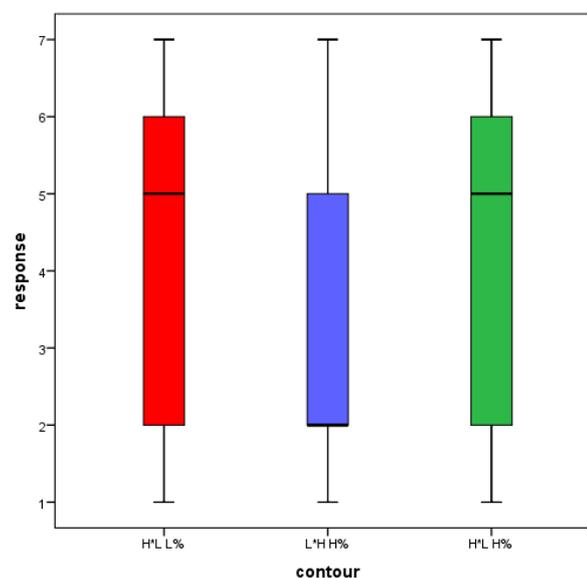


Figure 2. Boxplot of responses in the perception experiment for pitch contours H\*L L%, L\*H H%, and H\*L H%.

The Linear Mixed Model analysis revealed a main effect of final lengthening,  $F(1, 128) = 26.28$ ,  $p < .001$ , and pitch contour,  $F(2, 128) = 19.38$ ,  $p < .001$ . The main effect of questionnaire score (i.e.  $M_E - M_D$ ) was not significant,  $F(1, 11) = .186$ ,  $p = 0.674$ . The interaction effect of final lengthening and contour also failed to reach significance,  $F(2, 128) = .185$ ,  $p = .832$ ; none of the other two-way interaction effects of questionnaire score with length,  $F(1, 128) = .707$ ,  $p = .402$ , and questionnaire score with contour,  $F(2, 128) = .345$ ,  $p = .709$ , were not significant either. The three-way interaction effect of length, contour, and questionnaire score was not significant,  $F(2, 128) = .020$ ,  $p = .980$ . A further analysis of the fixed effects of final lengthening and pitch contour showed that the lengthened stimuli were significantly different from the non-lengthened stimuli ( $p = .003$ ).

Remarkably, further analysis of the effect of pitch contour on the response variable revealed that contour H\*L H% was significantly different from contour L\*H H% ( $p < .001$ ), but not from contour H\*L L% ( $p = .826$ ). An overview of the results of the Linear Mixed Model analysis of the perception experiment data can be found in Table 2 (next page).

Table 2

Parameter estimates for fixed effects on response in the perception experiment in the LMM analysis, and associated standard errors, t-values, and p-values. Interaction effects are not included in this table, since they were found to be non-significant in an earlier stage of the analysis (as described above).

Effect	Estimate	SE	t-value	p-value
Intercept	4.03	.27	15.19	.000
Length: 0 (original)	.69	.23	3.04	.003
Length: 1 (lengthened)	0	0		
Contour: H*L L%	.05	.22	.22	.826
Contour: L*H H%	-1.04	.24	-4.27	.000
Contour: H*L H%	0	0		
Questionnaire score	-.06	.18	-.34	.740

#### 4. Discussion and conclusion

The present study explored the role of final lengthening and pitch contour as cues in the turn-taking process by means of a perception experiment and a self-evaluative questionnaire on turn-taking in conversations. The following section provides a discussion of the results and conclusions.

First of all, analysis of the questionnaire scores per participant suggested that, contrary to expectations, most participants ( $n = 9$ ) evaluate their turn-taking skills in English with a slightly higher average score than their turn-taking skills in Dutch. However, the very low average mean questionnaire score ( $M_{\text{Etot}} - M_{\text{Dtot}} = .250$ ) seemed to suggest that in general, participants did not evaluate their English turn-taking skills as being notably different from their turn-taking skills in Dutch. This implies that caution should be taken when interpreting the results from the perception experiment, since the present questionnaire data do not support the assumption that the current Dutch L2 learners of English have not yet reached native-like competence in the use of prosodic cues for turn-taking in British English. It should also be noted, however, that the questionnaire is a subjective, self-evaluative measure, which requires from participants conscious reflection on their own skills, while the perception experiment might also (or mainly) require the use of subconscious knowledge on prosodic aspects of the turn-taking process. This might also explain the absence of a significant main effect of questionnaire score on responses in the perception experiment, as described below.

As was expected, the Linear Mixed Model with Crossed Random Effects revealed that final lengthening was generally associated with turn holding more often than with turn yielding in the

perception experiment in British English. That is, longer duration leads to more interpretation of turn holding than turn yielding. Participants thus generally reached native-like performance in their evaluation of British English stimuli. This was not true for the participants' behavior regarding their interpretation of the different pitch contours: contrary to what was defined as native-like performance, participants did not generally favor H\*L H% as a continuation contour in British English. Rather, the LMM analysis showed that L\*H H% was judged to be less turn-final than both H\*L H% and H\*L L%, and no difference was found between the effect of H\*L H% and H\*L L% on the response variable. Given that high final boundary tones were expected to be more often employed as turn-holding cues than as cues for discontinuation both in English and in Dutch, participants' apparent preference for the L\*H H% contour over the H\*L L% was to be expected, but the absence of a difference between H\*L L% and H\*L H% is highly remarkable. Native interpretation of the final boundary tones (independent of the nuclear pitch accent) should have shown a preference for both contours with H% as turn holding cues, and a difference between contours with H% and L% would have been more in line with native interpretation of the boundary tones as cues for turn-taking.

In addition to participants' non-native interpretation of the final boundary tones H% and L%, participants also failed to show a native-like preference for H\*L H% as opposed to L\*H H%. Based on the literature, it was assumed that native-like performance in the perception experiment would be indicated by a preference for H\*L H% (i.e. a nuclear H\*L pitch accent combined with a high boundary tone) as a turn holding cue. Although the pitch contour which seemed to be preferably associated with turn-holding indeed contained a high boundary tone, the nuclear accent was L\*H instead of H\*L. Since L\*H H% is a commonly used pitch contour to signal within-turn continuation in Dutch (cf. Caspers, 2003; Swerts & Geluykens, 1994), the association of L\*H H% with turn holding in English may be related to L1 transfer. In any case, participants' interpretation of H\*L H%, L\*H H% and H\*L L% does not resemble the perception of those pitch contours by native speakers as described in the literature in all respects. Since neither the use of final lengthening nor the employment of pitch contour as cues for turn-taking are generally taught in formal language learning environments, it can be hypothesized that knowledge of final lengthening as a cue for turn-taking is relatively easy to

acquire since the use of final lengthening in the turn-taking process might be more prevalent in formal English learning contexts than the use of pitch contour as a cue in turn-taking processes.

Especially since the analysis of the questionnaire indicate that the L2 learners in the present study generally do not consider themselves to be less adequate in turn-holding and turn-yielding in English than in their native language, and given that the perception data suggest that the participants do not perform native-like regarding the use of pitch contour as a cue for turn-taking in British English conversations, a plausible explanation should be found for the observed discrepancy between participants' self-evaluation and their actual performance in the perception experiment. Possibly, pitch contour might not play a major role in the turn-taking process. In that case, one would expect other factors, such as final lengthening and maybe even syntactic cues (Ford & Thompson, 1996) or visual cues, to be of more significance to the process of turn-holding and turn-yielding than pitch contour. On the other hand, these data might also suggest that formal language education is not sufficient to override the effects of potential L1 transfer and acquire native-like skills in all aspects of a second language. If that is the case, then this study might highlight the need for inclusion of formal education on prosody in language learning curricula.

In conclusion, although participants did not evaluate their English turn-taking skills as being notably different than their turn-taking skills in Dutch, they only showed native-like performance in their perception of final lengthening as a cue in the turn-taking process in British English. The L2 learners' interpretation of the different pitch contours in terms of cues for (dis)continuation was complex, and remarkably different from the perception of pitch contour by native speakers of English as described in the literature. In any case, more research is needed to investigate the role of pitch contour and the influence of formal instruction on the perception of conversationally relevant prosodic aspects in second language learning in general.

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## Appendices

### Appendix A: stimuli

Capitals indicate syllables bearing a nuclear pitch accent; underscored syllables bear a target nuclear pitch accent (i.e. H\*L, L\*H); and syllables bearing a pre-nuclear pitch accent are in italics. The sentences are partly adapted from Chen (2007).

1. The *game* will take a YEAR.
2. The *story* is too LONG.
3. I *ran* into WILliam.
4. We *visited* my AUNtie.
5. They *had* a little CHAT.
6. The *plot* is very BORing.
7. I *passed* him the MEssage.
8. I *just* met your FAther.
9. She *needs* a short BREAK.
10. We *were* in GREECE.

**Appendix B: questionnaire on experience in conversations**

Name: \_\_\_\_\_ Age: \_\_\_\_\_ Native language: \_\_\_\_\_

I'm a \_\_\_\_ year student of English. I speak Dutch, English, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

**Part A: Chatting in Dutch**

Below are a number of statements depicting one's experience with speaking in conversations involving multiple speakers who are native speakers of **Dutch**. Please indicate how much you agree with each statement by drawing a cross on the seven-point scale following each statement.

3. I often experience difficulty with keeping the floor in conversations with native speakers of Dutch.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

4. In conversations with native speakers of Dutch, I often find it difficult to determine when someone is finished with his/her turn and when I can take my turn.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

5. I never get interrupted in conversations with native speakers of Dutch.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

6. In conversations with native speakers of Dutch, I always manage to take my turn when I want to contribute to the conversation.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

7. I never have problems in keeping the floor in conversations with native speakers of Dutch.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

8. When talking with native speakers of Dutch, I often get interrupted.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

9. In conversations with native speakers, I often have difficulty taking my turn to make my voice heard.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

10. I never have problems determining when someone is finished with his/her turn and when I can take my turn.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

## Part B: Chatting in English

Below are a number of statements depicting one's experience with speaking in conversations involving multiple speakers who are native speakers of **English**. If you do not talk to native speakers of English often, please answer the questions based on your experience with talking (in English) to *proficient* speakers of English. Please indicate how much you agree with each statement by drawing a cross on the seven-point scale following each statement.

1. When talking with native speakers of English, I often get interrupted.

Strongly disagree

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly agree

2. I never get interrupted in conversations with native speakers of English.

3. In conversations with native speakers of English, I always manage to take my turn when I want to contribute to the conversation.

Strongly disagree

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly agree

4. I never have problems determining when someone is finished with his/her turn and when I can take my turn.

Strongly disagree

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly agree

5. In conversations with native speakers, I often have difficulty taking my turn to make my voice heard.

Strongly disagree

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly agree

6. In conversations with native speakers of English, I often find it difficult to determine when someone is finished with his/her turn and when I can take my turn.

Strongly disagree

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly agree

7. I never have problems in keeping the floor in conversations with native speakers of English.

Strongly disagree

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly agree

8. I often experience difficulty with keeping the floor in conversations with native speakers of English.

Strongly disagree

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Strongly agree

**Thank you very much for your participation!**