

# **The Prosody of Interrogatives at Transition-Relevance Places in Mandarin Chinese Conversation**

**By  
Jun Xu**

Thesis submitted to the University of Nottingham  
for the degree of Master of Research

March 2008

# CONTENTS

LIST OF TABLES .....	v
LIST OF FIGURES .....	vi
LIST OF GRAPHS .....	vii
ABSTRACT .....	x
ACKNOWLEDGEMENTS .....	xi
1. BACKGROUND .....	1
1.1. Preliminary .....	3
1.1.1. Prosody and language taxonomy .....	3
1.1.2. Defining the scope of prosodic features.....	4
1.1.3. Length, loudness and pitch .....	5
1.1.4. Prosodic resources in conversation .....	7
1.2. Research questions and significance.....	11
1.3. Overview of chapters .....	13
Notes.....	14
2. A REVIEW OF THE LITERATURE .....	15
2.1. Turn-taking in conversation.....	15
2.1.1. Basic concepts of the turn-taking system.....	15
2.1.2. Adjacency pairs.....	18
2.2. The role of prosody in non-tone languages.....	20
2.3. The prosody of transition-relevance places in Japanese .....	24

3. INTRODUCTION TO THE PROSODY OF MANDARIN CHINESE .....	26
3.1. Introduction .....	26
3.2. The prosody of Mandarin Chinese.....	27
3.2.1. Lexical tone .....	27
3.2.2. Sentence intonation.....	32
3.2.3. Tone and intonation .....	34
3.2.4. Summary.....	37
3.3. Interrogative intonation .....	37
3.4. Interrogatives in Mandarin Chinese Conversation .....	41
3.4.1 Interrogative taxonomy.....	42
3.4.2. Particle questions .....	44
3.4.3. Disjunctive interrogatives.....	46
3.4.4. Question word interrogatives.....	47
3.4.5. Tag questions .....	49
3.4.6. Summary.....	51
3.5. Turn-internal vs. turn-final yes/no interrogatives .....	52
3.6. Summary.....	57
4. RESEARCH METHODS .....	60
4.1. Map Task .....	61
4.1.1. Strengths of Map Task .....	62
4.1.2. Limits of Map Task.....	63
4.2. Research design .....	64

4.2.1. Procedure .....	64
4.2.2. Subjects.....	65
4.2.3. Data.....	67
4.3. Instrumental analysis .....	71
4.4. Summary.....	72
5. RESULTS AND DISCUSSION .....	73
5.1. Prosodic characteristics of the <i>ma</i> -particle question.....	74
5.1.1. Pitch patterns of the <i>ma</i> -particle questions .....	75
5.1.2. The pitch movement of the final syllable <i>ma</i> .....	84
5.1.3. Effect of the preceding toned syllable on following toneless syllables ...	86
5.2. Prosodic characteristics of the ‘A-not-A’ interrogative.....	106
5.2.1. Pitch movement of the final prosodic unit of the ‘A-not-A’ interrogative	106
5.2.2. Pitch movement over the final syllable of the ‘A-not-A’ interrogative..	115
5.2.3. Effect of the underlying tone on the yes/no interrogative intonation.....	116
5.2.4. Summary.....	126
5.3. Final pitch of the turn-final declarative .....	127
5.3.1. Tone0 .....	128
5.3.2. Tone1 .....	134
5.3.3. Tone2 .....	139
5.3.4. Tone3 .....	144
5.3.5. Tone4 .....	149
5.4. Turn-final and turn-internal yes/no questions.....	158

5.5. Summary.....	164
6. CONCLUSION .....	166
APPENDICES .....	171
I. Transcription notations.....	171
II. Abbreviations in the transcripts.....	171
REFERENCES .....	172

## LIST OF TABLES

4. 1 Subject details.....	65
4. 2 Data details .....	67
5. 1 Phonetic features of the toneless syllable after the toned syllable.....	87
5. 2 Summary of <i>ma</i> -particle questions .....	104
5. 3 Summary of A-not-A questions .....	125
5. 4 Summary of declaratives .....	157

## LIST OF FIGURES

4. 1 Sample for Instruction Giver's map.....	69
4. 2 Sample for Instruction Follower's map .....	70
5. 1 Distribution of the pitch movement of the <i>ma</i> -particle question.....	83
5. 2 Pitch movement of the final syllable of <i>ma</i> in the yes/no questions.....	85
5. 3 Pitch movement of the final syllable of turn-internal and turn-final yes/no questions in Mandarin Chinese conversation .....	159

## LIST OF GRAPHS

3. 1 Turn-internal rise in <i>dengling</i> .....	55
3. 2 Turn-final rise in <i>dengling</i> .....	56
5. 1 Non-final fall-rise in <i>cheng le ma</i> .....	76
5. 2 Turn-final fall in <i>wan bi ma</i> .....	77
5. 3 Turn-final fall-level in <i>cheng le ma</i> .....	78
5. 4 Turn-final rise-fall in <i>haiwan ma</i> .....	80
5. 5 Turn-final level-rise in <i>mingbai le ma</i> .....	81
5. 6 Non-final rise in <i>qiang le ma</i> .....	82
5. 7 Non-final rise-fall in <i>duan le ma</i> .....	88
5. 8 Turn-final low-rise in <i>muguang ma</i> .....	90
5. 9 Turn-final fall in <i>mingbai le ma</i> .....	92
5. 10 Non-final fall-rise in <i>guangjingtai ma</i> .....	93
5. 11 Turn-final fall-level in <i>cheng le ma</i> .....	94
5. 12 Turn-final fall-rise in <i>hao le ma</i> .....	96
5. 13 Turn-final level in <i>dian le ma</i> .....	97
5. 14 Non-final level in <i>dian le ma</i> .....	98
5. 15 Turn-final fall in <i>dao le ma</i> .....	100
5. 16 Turn-final fall-rise in <i>dao le ma</i> .....	101
5. 17 Turn-final fall-level in <i>dao le ma</i> .....	102
5. 18 Turn-final fall-rise in <i>dengling</i> .....	108



5. 19 Turn-final fall in <i>pubu</i> .....	109
5. 20 Turn-final fall-level in <i>feixu</i> .....	110
5. 21 Turn-final rise-fall in <i>cangbaodi</i> .....	111
5. 22 Turn-final rise-level in <i>tian'ehu a</i> .....	112
5. 23 Turn-final rise in <i>jiaohu</i> .....	113
5. 24 Non-final level-fall in <i>xiangjiaoshu</i> .....	114
5. 25 Turn-final fall in <i>shangfang</i> .....	117
5. 26 Turn-final fall-rise in <i>haiwan</i> .....	119
5. 27 Turn-final rise-fall in <i>wancheng</i> .....	120
5. 28 Turn-final fall in <i>shangfang zou</i> .....	121
5. 29 Turn-final fall in <i>shifou you</i> .....	122
5. 30 Turn-final fall-level in <i>shi bu shi</i> .....	124
5. 31 Turn-final fall in <i>mingbai le</i> .....	129
5. 32 Turn-final fall in <i>shuo ba</i> .....	130
5. 33 Turn-final fall in <i>wan le</i> .....	131
5. 34 Turn-final fall in <i>liang ge</i> .....	132
5. 35 Turn-final fall in <i>yangzi</i> .....	133
5. 36 Turn-final level in <i>yige wan</i> .....	135
5. 37 Turn-final level in <i>yi bian</i> .....	136
5. 38 Turn-final level in <i>shiquan</i> .....	137
5. 39 Turn-final level in <i>dengyao</i> .....	138
5. 40 Turn-final level in <i>difang</i> .....	139

5. 41 Turn-final rise in <i>you ge qiao</i> .....	140
5. 42 Turn-final level in <i>xiliu</i> .....	141
5. 43 Turn-final level in <i>yanshi</i> .....	142
5. 44 Turn-final rise in <i>shengsuoqiao</i> .....	143
5. 45 Turn-final level in <i>dengling</i> .....	144
5. 46 Turn-final fall in <i>zhongdian</i> .....	145
5. 47 Turn-final fall in <i>baishui</i> .....	146
5. 48 Turn-final fall in <i>zuozou</i> .....	147
5. 49 Turn-final fall in <i>xia zou</i> .....	148
5. 50 Turn-final fall in <i>dehua</i> .....	149
5. 51 Turn-final fall in <i>gengdi</i> .....	150
5. 52 Turn-final fall in <i>shikuai</i> .....	151
5. 53 Turn-final fall in <i>simu</i> .....	152
5. 54 Turn-final fall in <i>dagai</i> .....	153
5. 55 Turn-final fall in <i>chelun</i> .....	154
5. 56 Turn-internal rise in <i>chelun</i> .....	155
5. 57 Turn-final level-rise in <i>mingbai le ma</i> .....	161
5. 58 Turn-final fall in <i>mingbai le ma</i> .....	162
5. 59 Non-final level-rise in <i>mingbai le ma</i> .....	163

## ABSTRACT

This study aims to address the issue of the extent to which prosody contributes to projecting possible turn endings in Mandarin Chinese conversation. The research specifically focuses on the realization of the pitch contour of the final syllable in yes/no questions, based on a small scale of study of eight map-task-type conversations. The examination of 62 *ma*-particle yes/no questions and 75 yes/no questions with the construction of ‘A-not-A’ or ‘Copula-NEG’ suggests falling intonation is the most prominent pitch contour in yes/no questions at ends of turns in map-task-type conversations in Mandarin Chinese. The analysis of my data has also shown that the yes/no interrogative might have a terminal level, and they may end in rising and falling. Another finding is that the underlying tone of the last toned syllable plays a crucial role on the surface of the final pitch movement of yes/no interrogatives ending with toned syllables. On the basis of this finding, inspection of the turn-final declarative demonstrates that the same final pitch patterns displayed in the ‘A-not-A’ interrogatives ending with toned syllables exist in the turn-final declaratives in my data.

This research suggests that prosody plays a restricted role in projecting possible transition relevance places in Mandarin Chinese conversation, since prosody, particularly pitch, may be primarily used to differentiate meaning at the lexical level. Despite the limited number of participants and recorded conversations, these findings might not only contribute to the study of the role of prosody in conversation in general, but also provide some insights into the final pitch movement of the yes/no question in Mandarin Chinese.

## ACKNOWLEDGEMENTS

I would like to thank my dissertation supervisor, Professor Rebecca Hughes, Director of the Centre for English Language Education of the University of Nottingham. Without her assistance, patience, and exact advice, this dissertation could not have been completed. Gratitude is also offered to Dr. Beatrice Szczepek Reed who provided persistent support and encouragement during the process of writing up the dissertation. Her careful and insightful comments were of inestimable value. All remaining shortcomings in the dissertation are my own responsibility.

Additionally, I am very grateful for Prof Bing LI from the Linguistics Department in Hunan University, China, and I have learned the fundamental concepts in phonology from him. He always gives support and inspiration in my research. Also, I wish to acknowledge the assistance of Yan Yang and four anonymous students from Hunan University, China, for helping me collect the data. In addition, I would like to pay tribute to the support I have had from Mr. Kin-Kwok Chung as well as my home institution, Hunan University, in China.

Finally, I particularly wish to thank my dear husband, Tong Shu, and my lovely daughter, Xin Shu, for their encouragement and a lot of patience during my one-year study at the University of Nottingham in the United Kingdom.

## 1. BACKGROUND

Building on previous research on prosody in Mandarin Chinese and turn-taking mechanisms in other languages such as Japanese, German, Dutch and English, the aim of this study is to explore the role of prosody in the projection of turn delimitations in Mandarin Chinese conversation. In essence, it is the area of research at the interface of linguistics and conversation analysis. An investigation into the prosodic resources used in Mandarin Chinese conversation is a relatively new area of research and this study serves as a pilot project of its kind.

Most research on prosody in Mandarin Chinese so far is based on data in such elicited conditions as reading invented and imagined phrases and sentences aloud in isolation. However, the data in this study come from relatively naturally occurring dialogues of the Map Task. The details of the Map Task are discussed in Chapter Four.

The study is structured as follows. Firstly, a description of the classic type of questions in Mandarin Chinese is presented in terms of their syntactic structures by using the data of the eight map-task conversations. There are generally two basic types of questions found in my data: the question word interrogatives, and the yes/no interrogatives. The latter encompasses the disjunctive interrogatives (also called 'A-not-A' questions), the tag interrogatives, and the particle interrogatives. In particular, the yes/no question is discussed with exemplification from the data, including the *ma*-particle question and the 'A-not-A' yes/no question. The yes/no question is a typical first pair part of a question/answer adjacency pair. As such, it provides a slot for the

recipient to produce a yes/no response token as the second pair part to confirm or negate the main idea in the question.

Secondly, the prosodic characteristics of the *ma*-particle question are described through an investigation of all 62 instances in the data. The rationale behind studying the prosodic features of the utterance-final syllable *ma* is that *ma* is a toneless syllable whose tonal shape and tonal value are unspecified. For this reason, the influence of the preceding lexical tone and the overall interrogative intonation could be observed.

Thirdly, the prosodic characteristics of the yes/no question with ‘A-not-A’ frame or in the form of ‘Copula-NEG’ are described by a careful examination of all 75 instances. The reason of looking into the ‘A-not-A’ question is that the utterance-final syllable can be one of the four citation tones in addition to the neutral tone. Therefore, the interaction between the underlying tone and the interrogative intonation may become more complex.

In a fourth step, the turn-internal (i.e. positioned within a current speaker’s turn) and turn-final (i.e. positioned at the end of a current speaker’s turn) yes/no questions are compared in terms of their pitch movements of the last syllable against that of the preceding syllable. The purpose of this comparison is to find out whether prosody is strongly connected with the turn design and turn organization in Mandarin Chinese conversations. In other words, my data will give an insight into whether there is strong correlation between the particular pitch movement of the last syllable and turn behaviour in conversation in addition to the syntactic markers such as the question particle of *ma* and the syntactic construction of ‘A-not-A’.

The final step is to present the analysis of the final pitch of the turn-final declarative and to find out whether the underlying tone of the last syllable plays a part in the final pitch of the turn-final declarative.

## **1.1. Preliminary**

In this part, some basic concepts and facts about prosody are introduced to help understand the prosody of yes/no questions in Mandarin Chinese and the role of prosody in Mandarin Chinese conversations.

### **1.1.1. Prosody and language taxonomy**

Prosody, particularly pitch, gives a great deal of linguistic and para-linguistic information. Linguistic categories such as stress, accent and tone can be expressed as local excursions of pitch movement. Typologically speaking, there are three different categories of languages in terms of functions of prosody: (i) a stressed language; (ii) an accentual language; and (iii) a tone language.

Firstly, English could be seen as an example of a stressed language (Bao 2003). Stress location is part of the lexical entry of each English word. For example, “English” and “Chinese” both have stress on the first syllable, whereas “American” has stress on the second syllable. When an English word is spoken in isolation in declarative intonation,  $F_0$  (Fundamental frequency) typically peaks on the stressed syllable.

Secondly, following Yip (2002: 259), Japanese can be thought of as an example of an accentual language, although there is some debate about the categorization of Japanese. A word is lexically marked as accented or unaccented on a particular syllable. A

simplified description is that pitch rises near the beginning of an accentual phrase and falls on the accented syllable (Pierrehumbert and Beckman 1988).

Thirdly, Mandarin Chinese is an example of a lexical tone language (Bao 2003). Each syllable is lexically marked with one of the four lexical tones, and occasionally with a fifth, neutral tone. Tones have distinctive pitch contours. Altering the pitch contour may have the consequence of changing the lexical meaning of a word, and perhaps the meaning of a sentence.

### **1.1.2. Defining the scope of prosodic features**

It is commonly agreed that there are three significant variations in terms of acoustic qualities: fundamental frequency ( $F_0$ ), duration and intensity (amplitude). On the perceptual level of representation, the corresponding prosodic events are pitch, length and loudness.

As far as the category of prosody is concerned, it is difficult to define its boundaries. Crystal (1969) restricts the category to only those auditory effects which can be traced to the dimensions of pitch, loudness and duration, and whose domain is minimally the syllable. He claims that other auditory effects such as giggling and whispering cannot be taken as prosodic because they are not continuous with speech at all times.

However, other researchers take a more comprehensive view. Firth (1957) claims that prosody includes all types of syntagmatic relations holding between syllables, such as syllable structure and number or nature of the syllables, involving stress, tone, quantity or quality. In this view, breathiness, creak, nasalization and whisper can qualify as prosodic, provided that they are independent of the phonemic make-up of single sounds.



What sort of roles do prosodic cues play in conversation? Research so far has suggested that it is implicated in both structural and interactional dimensions of talk-in-interaction. Prosody can be seen as one of the resources at speakers' disposal for handling the tasks of turn constitution and turn-taking. In European languages, prior research has shown that prosody could play a supportive role in projecting possible completion points in conversations.<sup>1</sup> My data will be analyzed by reference to the role of prosody of yes/no interrogatives for signaling possible turn completions in Mandarin Chinese conversation.

### **1.1.3. Length, loudness and pitch**

This section aims to define which aspects of prosody are most central to the study. Prosody is a word deriving from Greek and referring roughly to the musicality of phonetic sequences. Prosodic features typically exceed the segmental domain. As a result, prosody is often seen as the suprasegmental properties in speech. Such prosodic elements as tone, stress, rhythm, and intonation are at a level of a higher complexity than that of the mere segment.

In the first place, it is important to distinguish the duration of phonological constituents such as segments, syllables and words. Hubbard (1994) notes that segment duration can be influenced by moraic structures across languages. In addition, word length can be affected by the syllable structures.

Secondly, loudness as perceived by the listener is associated with the breath-force that a speaker uses. The important acoustic correlate of loudness is intensity or the amount of energy, which is present in a sound or sequence of sounds. Variations in

intensity are produced by variations in the pressure of air coming from the lungs.

Thirdly, pitch is the prosodic feature most centrally involved in intonation, and intonation can be defined as pitch movement. Physiologically, pitch is primarily dependent on the rate of vibration of the vocal cords within the larynx. Rate of vibration of the vocal cords is reflected in the acoustic measurement of fundamental frequency. The term 'fundamental frequency' refers to the number of repetitions of the regular waveform per second. Such a regular waveform represents the vocal cords vibrating for voicing. As such, the number of times that the vocal cords completely open and close in one second is directly related to the frequency of the waveform. Fundamental frequency among male speakers varies between 100 Hertz and 150 Hertz and among female speakers between 170 Hertz and 220 Hertz (Anne and Lawrence 2004).

Pitch is used for differences of tone in tone languages (Cruttenden 1997; Yip 2002). Basically, tone is a feature of the lexicon, and it is described in terms of prescribed pitches for syllables or sequences of pitches for morphemes or words. In contrast, intonation is a feature of phrases or sentences. Tone is concerned with the pitch patterns of words. Broadly, a change of meaning is produced if one tone is exchanged for another over one syllable without changing the segmental composition. This results in sets of words distinguished only by tone.

It is worthy of note that prosodic features can extend over varying domains. Sometimes they extend over relatively short stretches of utterances, such as one syllable or one morpheme or one word. The tones of tone languages are generally related to

such shorter domains. Sometimes they extend over relatively long utterances, such as phrases, clauses, or sentences. As such, intonation is generally connected with such longer domains.

In this study, pitch is the most relevant concept for my investigation of the prosodic features of yes/no questions in spoken data. The analysis of my data will suggest that the pitch contour at the end of the interrogative is the result of the interaction between the underlying tone of the final syllable, the interrogative intonation, and the type of conversational action or practice in talk-in-interaction.

#### **1.1.4. Prosodic resources in conversation**

Based on previous research, prosody can be exploited as a resource to manage turn organization and turn-taking in conversation. It should be noted that not all the prosodic components are included in abstract models of sentence intonation, but all may play a part in the signaling of conversation structure. Research suggests, for example, that voice quality could be modified for communicative purposes. For instance, breathy voice might be used for intimacy.

When it comes to prosody of conversation, we must bear in mind that conversation can be analyzed from a number of different perspectives. For instance, conversation can be analyzed semantically by reference to its topic structure, and it can also be analyzed structurally as a sequence of turns, adjacency pairs (Sacks et al. 1974), among others. The study of prosody in conversation must therefore take into account the fact that prosody has more than one discourse function, including (i) to reflect the coherence relations and coherence breaks present in the conversation, and (ii) to organize and

---

construct the interaction itself such as turn ceding, floor holding, interruptions, backchanneling, and the like.

In Mandarin Chinese, however, pitch is primarily used to differentiate word meanings at the lexical level. At the same time, pitch is also employed to indicate different effects as well as syntactic distinctions at the grammatical level. This dual function of pitch in tone languages seems to make it difficult to separate the underlying tone from the sentence intonation in spoken data. For this reason, it is a big challenge to look into the role of prosody in the turn-taking mechanisms in Mandarin Chinese.

The most relevant literature centers on prosody and turn-taking in European languages. Research shows that conversation is a highly structured activity and that participants in a conversation follow tacit conventions in a co-operative way. Taking turns at speaking is one of these conventions, and requires participants to recognize when they may or may not take a turn. In order to do this, participants must be able to respond to a number of signals. They must first of all be aware of certain conventions that indicate, for example, that a question requires an answer, that a summons requires a response, and that a greeting requires a return greeting.

Prior work on the prosody of conversation has tended to concentrate on its role in interaction management, particularly turn-taking cues and interruptions. Research has demonstrated that prosody is one of the indispensable linguistic resources deployed by interactants to signal communicative intentions. For instance, Schegloff (1996) notes that pitch peaks play a significant role in projecting that the next syntactically possible completion point may be the designed end of the turn in English conversation. Setting

(2000) discusses the prosody of German conversation and she argues that transition-relevance places are produced and oriented to holistically, and that there is a close link between the projectability of syntactic completion and prosodic completion, although syntax occasionally is decoupled from prosody, or vice versa. Additionally, Ogden (2002) carries out research on prosody of Finnish conversation and notes that creaky voice can be seen as an important linguistic-phonetic component of the turn-taking system and intonational resources, but independent from syntactic and lexical resources. Caspers' (2003) research on prosody of Dutch conversation indicates that syntactic completion is the main projecting factor in transition-relevance places, while prosody just plays a supportive role in the turn-taking mechanisms. Tanaka (2004) argues that prosody seems to be enlisted as an alternative resource when syntactic resources are not employed for the localization of possible turn completion. She then suggests that prosody may be playing a relatively subordinate role in Japanese when utterance-final objects are used.

Regarding interruptions, French and Local (1983) examine natural conversation in order to show the difference between turn-competitive and non-competitive interruptions. They note that the use of pitch and loudness are associated with competitive interruptions. When both raised pitch and loudness are present in an interruption, the current speaker modifies his or her speech prosodically, indicating a willingness to relinquish the floor or the intention to continue.

It is worth noting that any prosodic pattern may have different functions depending on its context. For instance, Ogden (2001) observes that creaky voice and glottal stops

may have different functions as turn-holding or turn switching in Finnish talk.

Most importantly, research on prosody and turn-taking has demonstrated that intonation can provide cues to smooth turn-taking in addition to semantic and syntactic signals in non-tone languages (e.g., Ford and Thompson 1996; Selting 1998; Caspers 2003).

Another very relevant notion in this study is the turn-constructive unit (TCU), which has been defined as the smallest unit from which to form a turn at talk (Schegloff 1996).

Sacks et al. (1974) claim that TCUs are made up of different sorts of syntactic constituents, such as words, phrases, clauses and sentences. Obviously, all these syntactic constituents are hierarchically ordered with respect to one another. Research has shown that a morpho-syntactically constituted lexeme, phrase or clause could construct a TCU and be considered a transition-relevant place (TRP) provided that it is configured with a potentially complete intonation contour (Ford and Thompson 1996).

It is important to note that prosody in connection with transition-relevance places has been investigated in the above studies in non-tone languages such as English, German, Dutch and Japanese. There are two kinds of views in relation to the role of prosody in non-tone languages. One view is that prosody plays a secondary role in projecting potential transition-relevance places in conversation, such as in Dutch and Japanese. On the other hand, Selting (2005) suggests that prosody carries the same weight as syntax in the turn-taking mechanism in German natural conversations. In this respect, one issue under discussion is whether the findings as to the role of prosody in conversations in

non-tone languages could apply to that in a tone language such as Mandarin Chinese. In other words, what role prosody plays for transition-relevance places in Mandarin Chinese conversation is an open question.

Typologically speaking, the research on prosody in Mandarin conversation is far-reaching, because Mandarin is a tone language and the findings associated with the prosody for marking transition-relevance places in Mandarin Chinese could add to the knowledge of turn-taking mechanisms in conversation in general.

Recently, Tseng (2001) notes that lexical tones are characteristics of spoken Mandarin Chinese, and that the interaction of lexical tones and the other prosodic means such as stress and intonation are related to a number of research issues, particularly in conversation. For instance, a lexical item with a falling pitch (Tone 4, 51) does not show falling tendency any more, when the associated word is used for specific discourse functions such as indicating hesitation or the end of a turn. In this study, I will ask whether the pitch movement of the last word of a yes/no question changes or remains the same if the word with the falling tone is placed turn-finally. In other words, it might be the case that conversational activity plays a part in the ultimate pitch contour of the last syllable of a turn. The speaker's intention to terminate the turn might affect his/her production of the original pitch movement of the underlying tone of the last syllable in the spoken Mandarin Chinese data.

## **1.2. Research questions and significance**

The study of turn-taking mechanisms has been one of the most fundamental issues

of conversation analysis so far. Prior research has shown that conversational turns are generally constructed in such a way that next speaker can start speaking without any gap or overlap at the point of speaker changes. More recently, Ford and Thompson (1996) note that such a “smooth” speaker change in American English usually occurs at Complex Transition Relevance Places (CTRP), where syntactic, intonational, and pragmatic completions converge. In their work, intonation seems to be a significant component contributing to the smooth turn exchanges. That is to say, prosody is closely associated with the turn-taking mechanisms in English conversations. The most important issue is the extent to which prosody affects the projectability of the potential turn delimitations in natural spoken data.

The research reported here helps contribute a tentative answer to the following question: To what extent does the prosody of yes/no interrogatives contribute to the turn-taking mechanisms in Mandarin Chinese conversation? The general research question could be expanded as follows: (i) What are the syntactic characteristics of the yes/no interrogative in the map-task-type conversation in Mandarin Chinese? (ii) What are the prosodic characteristics of the *ma*-particle interrogative? (iii) What are the prosodic characteristics of the yes/no question with ‘A-not-A’ frame or in the form of ‘Copula-NEG’? (iv) What is the difference between the turn-internal and turn-final yes/no interrogative with respect to final pitch? And (v) Is there any difference between turn-final declaratives and A-not-A interrogatives in terms of their final pitch?

These questions are to be investigated in three steps. Firstly, we aim to provide an understanding of the final pitch movement of the *ma*-particle question and the yes/no



question with ‘A-not-A’ frame through an examination of the 137 yes/no questions turn-internally and turn-finally in the eight map-task conversations. Secondly, we attempt to explore the correlation between the final pitch movement of the yes/no interrogative and the projectability of potential transition-relevance places, and thus to investigate the role of prosody in Mandarin Chinese conversation. Finally, we present the analysis of the turn-final declarative to find out whether there is any difference between turn-final declaratives and A-not-A interrogatives in terms of their final pitch.

### **1.3. Overview of chapters**

Chapter 1 gave a brief overview of the definition, functions of prosody and features of prosody, and the prosodic resources deployed for marking transition-relevance places in conversation.

In Chapter 2, some fundamental notions of turn-taking and prosody for marking transition-relevance places are reviewed for several non-tone languages, such as English, Dutch and Japanese. This review is intended to help the reader conceptualize the subsequent findings presented on the role of prosody of turn-final yes/no interrogatives in projecting possible turn delimitations in Mandarin Chinese.

Chapter 3 looks at previous studies of Mandarin Chinese prosody, including lexical tones and their pitch representations and characteristics, sentence intonation, the interaction of lexical tone and sentence intonation. In addition, the syntactic structures of four types of Mandarin interrogatives are described with examples from the eight map-task-type conversations: the particle question, the question word question, the

disjunctive question and the tag question.

Chapter 4 describes the details of the Map Task and instrumental analysis. Their advantages and disadvantages are discussed. The data gathered from the Map Task lay the foundation for the instrumental analysis in this study. The speech-analysis software program Praat Version 4.4.28 (Boersma and Weenink 2006) is used to illustrate fundamental frequency ( $F_0$ ) of relevant turns in conversations.

In Chapter 5, results are addressed and discussed. The first section presents findings concerning three types of pitch patterns. Secondly, I will examine turn-final yes/no questions in my data. Thirdly, I will investigate the final pitch of turn-final declaratives to find out whether there is any difference between the turn-final declaratives and A-not-A interrogatives ending with toned syllables. Finally, I will make a comparison between the turn-internal and turn-final yes/no questions, with the aim to investigate whether there is any connection between a particular final pitch contour of the yes/no interrogative and the possible turn completion.

Chapter 6 draws some conclusions concerning the final pitch movement of the yes/no interrogative in the map-task-type conversation and the effect and extent of the underlying tone on the final pitch movement of the yes/no interrogative, as well as the role of prosody of turn-final yes/no interrogatives in Mandarin Chinese conversation. Finally, open questions are pointed out for future research to focus on.

## Notes

1. See Chapter 3, Section 3.2 for a review of the literature on the role of prosody in non-tone languages.

## **2. A REVIEW OF THE LITERATURE**

This chapter looks at prior research on turn-taking and prosody for marking turn delimitations in non-tone languages such as English, Dutch, Finish, German, and Japanese. The first part is concerned with the literature on turn-taking; the second part is with the prosody used for marking potential transition-relevance places in some non-tone languages.

### **2.1. Turn-taking in conversation**

Turn-taking is one of the most relevant notions in this study, and it is one of the basic mechanisms in conversation which help to maintain talk. For smooth turn-taking, knowledge of both the linguistic and the conversational rules of a language is essential.

#### **2.1.1. Basic concepts of the turn-taking system**

In ordinary conversation, interactants naturally take turns to accomplish a range of activities in their life. Cook (1989) postulates that the turn-taking mechanism may vary between cultures and between languages. Sacks et al. (1974: 704) put forward a set of rules that govern turn-taking in English, which is independent of various social contexts:

- (i) when a current speaker selects a next speaker, that next speaker has the right and the obligation to take the next turn;
- (ii) if a current speaker does not select a next speaker, any one of the participants has the right to become next speaker. This is regarded as

self-selection;

- (iii) if neither is the case, a current speaker may resume his/her turn.

Another crucial notion in the turn-taking system is the 'transition-relevance place' (TRP). In conversation analysis, the TRP has been recognized as the critical site for the split-second precision of the turn-taking system and the sequential organization of talk (Sacks et al. 1974). However, how TRPs are constructed and recognized by speakers and recipients, and what constitutes the related notion of 'turn-constructural unit' (TCU), have been repeatedly questioned and discussed.

The notion of turn-constructural unit (TCU) introduced by Sacks et. al. (1974) is central to an understanding of how turn-taking is organized. What follows is a detailed discussion of the syntactic, prosodic and pragmatic cues for marking potential transition-relevance places.

Firstly, Sacks et al. (1974: 702) suggest that four types of syntactic units can comprise a TCU: sentences, clauses, phrases, and lexical items. In a study of 'turn-yielding signals', Oreström (1983) finds 95.2 per cent of smooth turn exchanges (no gap/no overlap) at places of syntactic completions. Similarly, Ford and Thompson (1996) note that approximately 70 per cent of all turn exchanges coincide with syntactic completion in speech. They note that syntactic completion occurs where a clause is complete, i.e. with an overt or directly recoverable predicate in the discourse context. However, a speaker change does not necessarily occur at every point of syntactic completion.

Secondly, Duncan (1972) identifies the phonemic clause as a basic unit in turn construction. He observes that a turn change is found to correlate with a phonemic clause terminating in non-intermediate pitch. Similarly, Oreström (1983) identifies the 'tone unit' as the basic prosodic element of the TCU. In his research, he finds that 96.3 per cent of turn change occurs at the completion of a tone unit with a non-level nucleus, providing strong confirmation of Duncan's (1972) earlier findings.

Finally, a turn is pragmatically complete when it 'recognizably implements an action' (Schegloff, 1996: 59). Recognition of this action is by the participants themselves, within the sequential context of the interaction. Thus, the TCU is grounded for practical participants as parties to interaction by some version of the actions the unit is doing (Schegloff, 1995). The role of pragmatic completion in turn-taking is confirmed in research by Ford and Thompson (1996) who find that pragmatic completion coincides with intonational completion in the vast majority of cases of smooth speaker changes. Oreström (1983), while working with a slightly different construct, finds a strong coincidence of semantic completion and turn changes.

Ford and Thompson (1996) also argue that intonation is just as important to the projection of the TRP. They point out further that syntax alone is in fact not the only predictor of turn completion. They propose the notion of 'complex transition relevance place' (CTRP), at which intonation, syntactic and pragmatic completions co-occur and next speakers consider the most appropriate place to start a turn.

In summary, although researchers such as Sacks et al. (1974) and Duncan (1972) focus on certain components of turn taking, there is a clear recognition of their

interrelated nature. In later work, Schegloff (1996) also acknowledges the importance of syntactic, intonational and pragmatic completion of the TCU.

On the other hand, there is relatively little knowledge about the turn-taking system in Mandarin Chinese conversations. Tseng (2001) points out that in spontaneous conversation, turn-taking usually takes place arbitrarily to the extent that every individual interacts differently with the others under different circumstances. In Mandarin Chinese conversation, there are words preferably used in turn-initial positions, and they normally have their pragmatic functions associated with their positioning in utterances.

In this study, some aspects of turn-taking mechanism in relation to prosody are investigated to cast light on Mandarin Chinese conversation.

### **2.1.2. Adjacency pairs**

Research has shown that conversations are sequentially ordered, and that adjacency pairs are fundamental units of sequential organization. A basic rule of adjacency pair operation is:

given the recognizable production of a first pair part, on its possible completion its speaker should stop and a next speaker should start and produce a second pair part from the pair type of which the first is recognizably a member (Schegloff & Sacks, 1973: 295-6).

Put simply, adjacency pairs consist of sequences which have the following features:

(1) two utterance length, (2) adjacent positioning of component utterance, and (3)

different speakers producing each utterance (Schegloff and Sacks 1973).

In the map-task-type conversation, there is a particular pattern for adjacency pairs, namely, Speaker A produces the first pair part (e.g. question) and Speaker B provides the second pair part (e.g., answer). Usually, the first pair part invites, constrains and partially determines the meaning and range of possible second pair part. The majority of yes/no questions used in the data are produced as the first pair parts in order to seek information or confirmation or secure an understanding of the given information in the prior talk within the same turn. The first pair part makes the second pair part the relevant next turn. In addition, Sacks et al. (1974: 718) note that questions are suited to do turn-taking work in the sense that they clearly call for a speaker change.

On the other hand, a small number of instances show that yes/no questions can emerge in the middle of the turn in conversations. In other words, the current speaker continues with the ongoing conversation after producing a yes/no question as the first pair part. In this circumstance, the speaker might employ some prosodic cues to indicate that he or she is going to carry on contributing to the turn-in-progress rather than give the floor to the recipient. From the perspective of the recipient, the key point is whether the pitch movement can help him or her recognize and project the turn incompleteness and keep silent. This study aims to find out whether pitch movement could be used to accomplish a conversation activity such as floor-holding or turn completion.

## 2.2. The role of prosody in non-tone languages

There is much evidence to demonstrate that prosodic cues are associated with transition-relevance places in naturally occurring conversation. Schaffer (1983) observes that rising pitch at the end of a clause is only effective to some extent and prosodic cues have an ancillary status when syntactic and lexical cues are present. Moreover, rhythmic cues such as pausing and vowel lengthening in clausal-final syllables (e.g., He's ba:d.) seem to be understood as possible turn-terminal signals. Local et al. (1986) show that the aspirated release of voiceless plosives can be used at turn-final positions in Tyneside English. At turn-final positions, these voiceless plosives have marked aspirated release, increasing their duration, whereas elsewhere in turns it is usual to find them glottalized with no audible oral explosion. This is important because it suggests that voice quality could be used to signal turn endings in some varieties.

Ogden (2002) carries out research on the prosody of Finnish conversation and notes that creak in Finnish talk-in-interaction is an important linguistic-phonetic component of the turn-taking system which is closely related to, but independent from syntactic and lexical resources, and intonational resources. He further explicates that turn-finality is marked by creak, breathiness, whisper, voicelessness, and exhalation.

In addition, Ogden (2004) contributes to the research on the linguistic use of non-modal voice quality in Finnish conversation. He notes that it is normative for native speakers to employ non-modal voice quality at the end of a turn, and also suggests that changes in voice quality from modal to non-modal are systematically deployed in the signaling of potential transition-relevance places.



With respect of Dutch conversation, Caspers (2003) concludes that syntactic completion is the main projecting factor in possible transition-relevance places, while prosody plays a supporting role. The findings of Caspers' work are aligned with the results reported by Selting (1998) for German and Ford and Thompson (1996) for English: syntax seems to be the main projecting factor in the turn-taking mechanism, while the local prosodic factors are used to signal whether a grammatical completion point is indeed a realized transition-relevance place, or whether the current speaker intends to hold the turn.

Caspers (2003) reports on her corpus research on the role that intonation may play in signposting the intention of a speaker to keep the turn. She makes quantitative analysis of eight map-task dialogues in Dutch, and investigates the relationship between local prosodic features such as pitch accents and boundary tones, and the turn-taking system in Dutch conversation. Additionally, she looks for systematic associations between prosodic characteristics, grammatical completion points and turn transition types.

In a recent paper, Zuraidah and Knowles (2006) carry out studies on prosody and turn-taking in Malay broadcast interview and conclude that prosody serves to provide information on possible turn-constructive units in Malay conversation. They present the following findings: (i) The completion of turn constructive units is usually associated with falling pitch while non-completion is linked with rising or sustained pitch; (ii) The pitch height and loudness are the prosodic features involved in signaling the status of the speaker's overlap as competitive or non-competitive; (iii) The turn-yielding is marked by decreased pitch height and diminuendo loudness gradually reaching the

point of unintelligibility. Their conclusions suggest that prosody has an undeniable role in signaling the completion of turn constructional units in Malay conversation.

The interesting point in Zuraidah and Knowles' (2006) study is that prosody in Malay conversation works in a similar way to English, although Malay lacks of stress or accentuation (Zuraidah and Knowles 2006: 511).

In order to examine the role of prosody in German conversation, Selting (1992) studies four aspects of question-word questions in conversational question-answer sequences in her German data: (i) syntactic structure; (ii) semantic relation to prior turn; (iii) prosody, particularly intonation; and (iv) activity types in conversational interaction.

One important assumption pointed out by her is that a particular syntactic construction type in unmarked (or neutral) cases calls for a particular unmarked intonation, but that this assumption needs to be revised. For instance, in German, declarative sentences are said to have falling terminal pitch, and the rising terminal pitch is said to turn them into questions. It seems that it is the same case in Mandarin Chinese grammar textbooks (e.g., Liu 2001). In addition, yes/no questions with subject-verb inversion in English are said to have the rising terminal pitch in unmarked cases.

More importantly, there are two major findings with regard to the link between final pitch movement and the activity type in German conversational interaction. The first finding is that all unrestricted 'open' conversational questions, which orient to new topic foci have rising terminal pitch. The second finding is that the restricted conversational questions detailing a prior topic and/or securing of understanding of prior talk have falling terminal pitch.

In addition, Thompson (1995) studies English conversation and suggests that there is not a straightforward correlation between intonation and grammar. She finds that English yes/no questions frequently have falling terminal intonation in real-life conversation in addition to instances of rising terminal intonation. In many textbooks which teach spoken English, pitch movement is treated as a discrete item and it is always fixed in relation to the form of a sentence: wh-questions have a falling tone, whilst yes/no questions have a rising tone. However, the opposite case is observed in real conversation data.

It is generally believed that there are two specific pitch contours at turn-final places in English conversation: the fall-to-low and the high rise, but this research result is derived from the analysis of intonation patterns at turn delimitations in Standard English conversations. Szczepek Reed's (2004) study finds four more pitch contours in addition to the two popular ones at turn-final positions, namely, pitch step-up, level intonation, rise-to-mid and musical intervals. Her research has furnished more evidence to suggest that different kinds of pitch movement can be deployed to signal smooth turn transition at turn-final positions in English conversation.

As far as Mandarin Chinese is concerned, the turn-final intonation is more complex since every stressed final syllable bears its own citation tone in its own right. At the same time, participants make use of intonation to express speakers' meanings or feelings and even to indicate the participants' intention to resume the turn or hand over the turn to the recipient at the end of the utterance, therefore there is an open issue concerning the interaction between the underlying tone of the final syllable of the utterance and the

sentence intonation at the turn-final positions.

### **2.3. The prosody of transition-relevance places in Japanese**

Prosodic resources employed in Japanese conversation are relevant for this study because Japanese is not in the family of European languages, and because there is already much research concerning turn-taking mechanisms in Japanese conversation. Tanaka (2004) collects the data from 37 telephone conversations and two face-to-face conversations among friends and families and finds that turn delimitations are marked with grammatical utterance-final items such as final particles and copulas. She defines 'truncated' forms as those turns which are unmarked by the grammatical utterance-final objects and argues that truncated turns deploy a wide range of phonetic resources to compensate for their limited capacity to grammatically project or signpost upcoming TRPs. She makes a typological study of the prosodic patterns of turn endings with the truncated form and discovers that there are five types as follows:

Type I: The utterance-final syllable consists of one mora, and the last mora displays such features as lengthening of the last syllable, resurgence of loudness, and pitch movement (usually falling).

Type II: The utterance-final syllable has two moras, and the penultimate mora demonstrates such features as lengthening of the penultimate mora, resurgence of loudness on the penultimate mora, and pitch movement (usually rising-falling on the final syllable).

Type III: Ending in a glottal stop and falling pitch.

Type IV: Ending in turn compression often with falling pitch.

Type V: Partial repetition of word/expression usually delivered with falling pitch and decreasing intensity.

Tanaka proposes that prosodic prominence on the final part of a turn through increased duration, resurgence of loudness and pitch movement are devices for turn delimitations and are observed more universally. In addition, Tanaka (1999, cited in 2004) claims that the use of turns without utterance-final objects can be employed contingently to formulate a setting or relationship as 'informal' or 'intimate', and may be used for the direct accomplishment of action. She concludes that prosody may be playing a relatively subordinate role in turn delimitation in Japanese when utterance-final objects are employed.

The most relevant finding is that prosody seems to be enlisted as an alternative resource, when grammatical resources are not being deployed for the localization of possible turn completion. This view will be important in my study of prosodic resources used in Mandarin Chinese conversations.

To summarize, this chapter has discussed the literature concerning turn-taking mechanism and the role of prosody in projecting turn delimitations in non-tone languages. The next chapter will deal with the background knowledge relating to the prosody of Mandarin Chinese.

### 3. INTRODUCTION TO THE PROSODY OF MANDARIN CHINESE

In this chapter, some basic concepts of prosody in Mandarin Chinese are presented with exemplification. These are relevant for the studies presented in Chapter Five, and particularly aim for the non-Mandarin speaking reader.

#### 3.1. Introduction

Typologically speaking, Mandarin Chinese and English are two different languages in terms of their very distinct means of accomplishing interaction through prosodic features. Mandarin Chinese relies on lexical tones to differentiate lexical meaning, whereas English does not. However, English has its own system of derivation and inflection. The issue of prosody for marking turn delimitations in Mandarin Chinese conversation seems to be more intricate than it is for English, as lexical tone and sentence intonation are interwoven at turn-final places. It could be argued that turn-final intonation in English is transparent and direct; because the pitch movement at turn-final places serves no lexical-semantic purposes, there is less overlap of prosodic functions.

This chapter will review some of the major studies on prosody of interrogatives in Mandarin Chinese, particularly lexical tone and sentence intonation. It is an attempt to gain a better understanding of the prosody of Mandarin Chinese in the context of map-task (see Chapter 4) conversations, and the overall goals that have been outlined in Chapter 1.

## 3.2. The prosody of Mandarin Chinese

Many languages use pitch to produce distinctive meaning at the word level, and those languages are called tone languages. Yip (2002: 4) defines a tone language as “a language with tone is one in which an indication of pitch enters into the lexical realization of at least some morphemes.” This definition includes the traditional tone languages of Africa and the Far East as well as the marginal tone languages of Europe, and excludes intonation languages, like English.

Tone in tone languages is a feature of the lexicon, and it is described in terms of prescribed pitches for syllables or sequences of pitches for morphemes or words. The tones of tone languages concern the pitch patterns of words. Put differently, a change of meaning is produced if one tone is exchanged for another over one syllable, while the segmental composition is kept unchanged. As a result of this, sets of words are distinguished only by tone and it is applied to many languages of the Far East.

### 3.2.1. Lexical tone

Mandarin Chinese has four tones in addition to a toneless syllable. For instance, five different words are produced when combined with the segmental sequence *ma*. Four tones and neutral tone in Mandarin Chinese are shown as follows.

Tone 0	<i>ma</i>	吗	a question marker	unspecified value
Tone 1.	<i>mā</i>	妈	‘ mother ’	/55/
Tone 2.	<i>má</i>	麻	‘ hemp ’	/35/
Tone 3.	<i>mǎ</i>	马	‘ horse ’	/214/
Tone 4.	<i>mà</i>	骂	‘ scold ’	/51/

### 3.2.1.1. Pitch representation of Mandarin Chinese tone

Throughout this study, all the yes/no questions in Mandarin Chinese are represented through the use of *pinyin*. In addition, some relevant syllables in the question are marked with their tonal values by digits. The representation of tonal pitch contours as digits is attributed to the scholar Yuenren Chao (1933). He devised this system to cover the tonal aspects of the Chinese languages and other tonal languages. It consists of five arbitrary levels, rather like the use of staves in music score. They are labeled from the bottom upwards, 1 through to 5 inclusive, 1 representing the lowest pitch, and 5 representing the highest pitch. Variance in pitch can be captured using the reference pitch numbers by observing the starting, middle and ending points of the tone. The numbers are enclosed in two forward slash marks. For example, /55/ is a high level tone, whilst /11/ is a low level tone. /53/ is a high falling tone, and /35/ is a mid rising tone. /31/ is a mid falling tone. /214/ is a tone which starts low and falls, and then rises again. Short tones can also be represented as a single number. For instance, a short mid level tone is /3/. In addition, /0/ represents a neutral tone without tonal specification. The question particle of *ma* bearing a neutral tone is the focus of this study.

### 3.2.1.2 Characteristics of pitch in Mandarin Chinese

In this study, the final pitch movement of the yes/no interrogative is a central focus. Some knowledge of the characteristics of pitch in Mandarin Chinese will help non-Mandarin readers understand the resources of prosody employed to accomplish conversational activities. The following is a brief summary of the features of pitch in Mandarin Chinese. Characteristics of pitch in Mandarin Chinese are shown as follows:



(i). Lexical information

The dictionary entry of each morpheme specifies a “ tone ” (sequence of two pitches, high or low) which that morpheme retains throughout the derivation except as modified by phonological rules.

(ii). Phonological rules

The phonological rules affecting pitch are assimilations and dissimilations that are conditioned by the immediately adjacent syllables. There is no action across several syllables at a distance. The tone sandhi phenomena in Mandarin Chinese are typical of phonological rules in dissimilations. For instance, a third tone becomes a second tone when immediately followed by a third tone.

(iii). Units of relevance

No distinction is made between “ long ” and “ short ” syllables. Syllables of any segmental composition may bear any of the four tones. However, there is a distinction between stressed and unstressed syllables, and unstressed syllables bear a pitch that is predictable from the tones on the surrounding syllables.

Perception tests on synthetic speech (Chuang 1972) confirm that sufficient cues for the discrimination and identification of the four tones in connected speech permit the representation of the tones. Acoustic correlates of lexical tone in Mandarin Chinese are illustrated as follows:

Tone 1 as mid-high flat

Tone 2 as rising from mid-low to mid-high

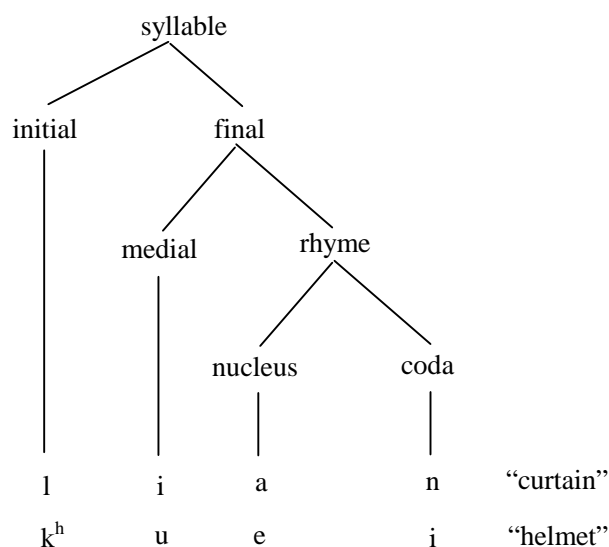
Tone 3 as low flat with rising end or simply low flat in certain environments

Tone 4 as falling from high to low

### 3.2.1.3. The syllable as the tone-bearing unit

Another relevant point is the connection between the syllable and the lexical tone in Mandarin Chinese. Syllable structure is an important notion for understanding the tone-bearing unit. In this respect, Yip (2002) notes that a tone is only realized on the surface if it is associated with some segment or prosodic entity such as the syllable or the mora, on which it is pronounced.

There is some evidence that every morpheme in Mandarin Chinese has one syllable, and every syllable bears one tone. However, it is still controversial whether the tone-bearing unit is syllable, segment or mora. In Mandarin Chinese, the maximal syllable consists of CGVX, that is, a consonantal onset, a prenuclear onglide, the nucleus, and a coda (which can be either an offglide or a nasal). The hierarchical structure of the syllable is illustrated in the following diagram. It is labeled with the traditional terms that are commonly used in Chinese philological literature. The hierarchical structure of the syllable is illustrated as follows:



The “ initial ” is the onset. The “ final ” includes the medial (onglide) as well as the rhyme. The rhyme consists of a nucleus and a coda. The nucleus is the only obligatory syllabic element, and thus bare vowels *i* “ to heal, ”*u* “ house, ”and the like can constitute legitimate syllables in Mandarin Chinese.

#### 3.2.1.4. Neutral tone

Neutral tone is an important notion in this study as question particle *ma* is a typical instance found in our data. Neutral tone, or the fifth tone is called *qingsheng* in Mandarin Chinese. Through a neutralization process, the neutral-tone syllable is neutralized from corresponding normal stressed syllables. In this sense, the neutral tone might have an affiliation with stress. For example, *明白* *mingbai* is a disyllabic compound word and the second unstressed syllable of *bai* is a neutral-tone syllable according to Liu and Song (2004: 247-252). Classification of the neutral syllable in compound words is a controversial issue in Mandarin Chinese. This study follows “A List of Neutral Tone in Compound Words for *Putonghua* Proficiency Test” (Liu and Song 2004: 247-252). Therefore, some compound words like *jingtai* (景台), *qidian* (起点) and *wancheng* (完成) in my data are not grouped into the category which has the neutral-tone syllable in the second unstressed position, despite the fact that *tai*, *dian* and *cheng* in their respective compound words are articulated as neutral-tone syllables in Beijing Mandarin.

There is a close link between tone neutralization and lexical construction in Mandarin Chinese. In terms of lexical construction, there are at least three groups of unstressed syllables. The first group is suffix, e.g., *桌子* *zhuozi* (‘desk’, Tone1 +

Tone0). The second group is the reduplication of the initial syllable, e.g., *猩猩* *xingxing* ('gorillas', Tone1 + Tone0). The third group is the root, e.g., *明白* *mingbai* ('understand', Tone2 + Tone0). However, Chao (1932) notes that some instances of tone neutralization have nothing to do with lexical construction, e.g., *聪明* *congming* ('clever', Tone1 + Tone0).

Prior research into the neutral tone has shown that the neutral-tone syllable has the following features: (i) It sounds weak and has low intensity; (ii) it does not have its original tone pattern in an unstressed position and its pitch contour is determined by the tonal difference of the preceding syllable; and (iii) it has shorter duration compared to its normal stressed syllable (e.g., Chao 1968, Cao 1986, Lin 1982). In my study, the neutral tone emerges in larger grammatical units like sentences rather than compound words or phrases. I will later focus on the interaction between the neutral tone and sentence intonation in turn-final position.

### 3.2.2. Sentence intonation

Apart from tone, intonation is another highly relevant notion in this study. According to Roach (1991: 133): 'there is no completely satisfactory definition of intonation, but any attempt at a definition must recognize that the pitch of the voice plays the most important part'.

Research on intonation patterns in Mandarin Chinese conversation is somewhat rare, and the patterns of Mandarin intonation have not yet been well established. There are few general conclusions regarding what the intonation patterns are. Moreover, the majority of research has been carried out on simple imagined and invented sentences read

aloud in isolation in elicited circumstances, rather than genuine utterances embedded in rapid familiar conversation.

Most of the previous work on the sentence intonation in Mandarin Chinese is concerned with emotive rather than with linguistic distinctions. For instance, Chao (1968) lists 13 basic “intonation” patterns for Mandarin Chinese as follows: (1) normal: ordinary statements; (2) suspense-conclusion; (3) accelerated tempo in the last few syllables: simple questions and simple commands; (4) extra wide range: airy, breezy expression and complaining; (5) high pitch, quiet: taking things lightly and asking questions a second time; (6) falsetto: impatience, strong disapproval; (7) low pitch: seriousness, praise and great feeling; (8) low, often breathy: questions of confirmation; (9) low and fast: parenthetical insertions; (10) negative pause: words trying to catch up with thoughts; (11) rising endings: incredulity, impatience, and preemptory command; (12) falling endings: lively enumeration, hearty agreement, correction of errors, remonstrance, reassurance, pretended emotion, and vocative forms; (13) random loudness: anger or impatience. In addition, Chao (1933) states that movement of pitch in Chinese speech expresses attitudes, moods and implications, which corresponds in part to intonation in English.

However, my work will not address the pragmatic functions of intonation in Mandarin conversation in general. The focus of this study is the prosodic features of a particular syntactic pattern: the yes/no interrogatives in Mandarin Chinese conversation. As far as interrogatives are concerned, Chao observes that sentence intonation is usually fairly high in questions ending in *ma*. My data will demonstrate that this observation is

true to some extent in certain phonological contexts, but it may not always be the case within the context of map-task-type conversations.

More recent research tends to be interested in the difference between interrogative intonation and declarative intonation. For instance, Shen (1990) records six types of utterances using sentences in which every syllable bears Mandarin Tone1, a high level tone. She notes that yes/no questions, with or without the *ma*-particle, differ from declaratives in having a mid-high starting point, a high value for the highest peak, and a high to mid-high for the ending point. In other words, yes/no questions exhibit a higher overall pitch register than declaratives.

Lin (2004) argues that there are two variables in Mandarin Chinese intonation, boundary tone and stress, and he notes that boundary tone is an indispensable variable to differentiate questions from statements in Mandarin Chinese. According to Lin (2004), the yes/no interrogative has different degrees of a scale by reference to its information: strong questions, weak questions, either questions or statements, non-terminal intonation, and statements.

### **3.2.3. Tone and intonation**

There is growing interest in the intersection between the lexical tone and sentence intonation in Mandarin Chinese. This study particularly looks at the interaction between the lexical tone and sentence intonation at the end of the yes/no question located either in the middle or at the end of a turn.

It is important to understand the relationship between the lexical tone and sentence intonation in Mandarin Chinese, which helps non-Mandarin readers conceptualize the

complex interplay between them at sentence level. Tone and intonation are two types of pitch variation, which are used by speakers of all languages in order to give shape to utterances. More specifically, tone encodes segments and morphemes, and intonation gives utterances a further discourse meaning that is independent of the meaning of the words themselves. However, ignoring their functions, it is an open issue whether tone and intonation can be analyzed with the same phonological features.

Lieberman (1975) and Pierrehumbert (1980) propose that intonation in English can be represented by a linear sequence of H and L tones. The sequence is made by a choice of tone patterns for each accentuated phrase and a proper choice of ‘boundary tones’ and ‘phrase accents’. This approach essentially treats intonation and tone as the same phenomenon. This approach has also been applied to pitch-accent languages such as Japanese (Beckman and Pierrehumbert 1986).

However, in languages like Mandarin Chinese, word tones are lexically determined, and there is little flexibility in varying the sequence of Hs and Ls independently. This raises the question of how languages like Mandarin Chinese express intonational meaning, such as statement, doubt, surprise, query, command, among other things.

Chao (1933) notes that many functions of intonation in other languages are fulfilled in Mandarin Chinese by the use of particles. When particles are not deployed, tone and intonation can be combined through ‘addition’. He differentiates two kinds of addition. The first is ‘successive addition’, where a rise or a fall is added to the end of an utterance. This is similar to a boundary H or L in English.

The second is ‘simultaneous addition’ where ‘addition’ indicates widening and

narrowing of pitch range, or raising and lowering, proposed by Chao (1933) and Ho (1977). In other words, the pitch range of an utterance is raised, lowered, expanded, or compressed when the lexical tone interacts with sentence intonation in spoken data. Chao (1933:131) provides examples to illustrate both types of additions in Mandarin Chinese. Two examples are illustrated in (1) and (2). It should be noted that the resulting syllables are lengthened in order to carry three tones.

(1) Tone		Intonation	
LH	+	L	→ LHL
<i>nan</i>			<i>nan</i>
‘difficult’		‘affirmation’	‘Surely difficult!’
(2) Tone		Intonation	
HL	+	H	→ HLH
<i>mai</i>			<i>mai</i>
‘sell’		‘question’	‘Sell?’

In (1) *nan* has LH and the final intonation L carries an affirmative meaning. When the two are added together, the result is a rise-fall (LHL). In (2) *mai* ‘sell’ has HL and the final intonation H carries a question meaning. When the two are added together, the result is a fall-rise (HLH). As this study focuses on the prosody of the interrogatives, interrogative intonation is the most relevant here. Shen (1990) notes that the interrogative intonation raises the pitch height of the entire utterance, without changing



the distinctive meaning of the lexical tones.

It is significant to find out whether the tonal shape or tonal value of the underlying tone could undergo some modifications at the end of the utterance in naturally occurring conversations. Previous research by Ho (1977) and Lin (2004) suggests that the final lexical tone retains its final fall or rise as its original tonal shape in citation form in the context of interrogative utterance. Their claims will be investigated further in this study.

### **3.2.4. Summary**

There are two different viewpoints concerning the effect of intonation on tones in Mandarin Chinese: whether the imposition is successive, as proposed by Chao (1933:131), or simultaneous, as suggested by Ho (1977) and Chao (1933). By ‘successive’, Chao means, for example, the adding of a rising pitch after an original falling pitch, to produce a falling-rising tone. ‘Simultaneous’ addition is described by Shen (1990) as involving the superimposition of an intonational trend over the whole of a sentence, so that incompatibility between intonation contour and lexical tone would result in tone neutralization, while congruency between these two prosodic phenomena would emphasize or enhance the contour features of the original tones.

The observations concerning the influence of tone on intonation by Chao (1968), Ho (1977), Shen (1990) and Lin (2004) are to be further discussed in this study.

## **3.3. Interrogative intonation**

The underlying tone of the last syllable of the yes/no question is one focus of this study, and it is important to have some knowledge of interrogative intonation in other

languages as well as in Mandarin Chinese in talk-in-interaction. The description of interrogative intonation is not simple and far from uncontroversial. Different types of questions in different languages produce different kinds of question intonation. The most commonly described characteristic for questions is high final pitch and overall higher pitch (Hirst and Di Cristo 1998).

Intonation patterns for interrogatives have been researched in some languages. For instance, in Neapolitan Italian, D'Imperio and House (1997) indicate that the time alignment of a final accent has shown to play a decisive role in the perception of interrogatives. Also, in Swedish, Gärding (1979) describes question intonation primarily as marked by a raised top line and a widened  $F_0$  range on the focal accent. In Hungarian, the distinction between yes/no questions and statements is not marked by lexical or syntactic features but solely by prosodic properties. Statement intonation consists of high tones associated with lexically stressed syllables, followed by a low boundary tone (Ladd 1983, as cited in Gósy and Terken 1994). Question intonation typically consists of a low target in the stressed syllable of the nuclear-accented word, followed by a high-low boundary tone.

In English, Thompson (1995) discusses yes/no question intonation with regard to the relationship between intonation choices and the speaker's communicative intention. In particular, she points out that falling terminal intonation in English is frequently ignored in the second language teaching contexts. There is good evidence that English yes/no questions frequently have falling terminal pitch and there is a fairly even distribution between yes/no questions with rising terminal intonation and falling terminal intonation

in English casual conversation. For this reason, she suggests that there is not a straightforward and simple correlation between the grammatical type of question and the intonation pattern chosen, although some previous studies propose a simple grammar/intonation model in English pronunciation textbook as follows:

- (i) questions with the answer yes or no go up at the end;
- (ii) questions starting with a wh-word go down at the end (Thompson 1995: 236).

Another interesting point is that intonation may be exploited to do politeness in interpersonal communication. For instance, the rising intonation on the final word in English wh-questions indicates politeness in marked cases. Research has shown that English wh-questions have falling terminal intonation in unmarked cases (Thompson 1995).

The most important argument is that intonation choice is associated with the speaker's communicative intentions, i.e., the activity the speaker wants to achieve in the conversational interaction. Thompson (1995: 239) classifies yes/no questions with reference to 'conducive' and 'non-conducive' questions. Conducive questions are used to check, confirm or secure the recipient's understanding of the topic because the speaker already knows the answer. On the other hand, non-conducive questions are used to find out the information because the speaker does not know the answer. Furthermore, she shows that rising terminal intonation on yes/no questions indicates a non-conducive question and falling terminal intonation suggests a conducive question. Based on the analysis of the relationship between the intonation choices and the speaker's interactional

intention, Thompson (1995: 240) revises the model of yes/no question as follows: “When you ask a yes/no question, if you do not know the answer, using a rising tone, but if you know you may know the answer, using a falling tone.”

Another study on the intonation of English yes/no questions indicates that rising terminal intonation is common, but there is a slight difference between yes/no questions in American English and those in British English. Research has shown that yes/no questions in American English have high-rising and those in British English have low-rising. Levis (1999) suggests that intonation of yes/no questions seems to play a minimum role in the success of interaction between speakers from different varieties of English.

In a production study of Dutch question intonation, Hann (2001) notes that a question is realized with rising terminal intonation in 86.6% of the cases and that yes/no questions with declarative syntax are marked with rising terminal intonation in 100% of the cases. In addition, 94 per cent of yes/no questions with question syntax exhibit a final rise and only 6 per cent of the syntactically inverted yes/no questions are not produced with a final rise in the Dutch data. However, Hann does not discuss the relationship between intonation and the activity types involved in the conversational interaction. Similarly, Selting (1995) observes 51 yes/no questions with rising intonation but also 14 with falling intonation in a corpus study of conversational data of Northern German, a variety closely related to Standard German.

From the German and Dutch data, it becomes clear that falling terminal intonation occurs less frequently than rising terminal intonation. However, the scholars do not

further discuss why speakers choose falling intonation in particular cases.

Following native speakers' intuition, question intonation in Mandarin Chinese is rising but not falling, no matter whether its surface form has a rising end or a falling end, which mainly depends on the underlying tone of the last syllable. Yuan, Shih and Kochanski (2002) suggest that the combination of question intonation with tone1 and tone3 creates some modification in the tone shape. Final tone1 (high level) has an overall rising shape, and final tone3 (falling-rising) obtains a distinctive rising tail. However, the combination of question intonation with tone2 (rise) and tone4 (fall) does not change the tone shape. Tone2 is still a rise and Tone4 is still a fall. These observations will be revisited in this study (see Chapter 5).

### **3.4. Interrogatives in Mandarin Chinese Conversation**

In Mandarin Chinese, yes/no questions can be marked by a sentence-final question particle *ma*. In the absence of such a question particle, questions are distinguished from statements intonationally. A great deal of attention has been given to the difference between 'question intonation' and 'statement intonation' in research of Chinese intonation (e.g., Yuan, Shih and Kochanski 2002). What most studies seem to agree on is that questions appear to have a higher pitch register than statements. However, a weaker version of this view is that question intonation begins at a higher pitch register than statement intonation but does not necessarily end high (Shen 1990).

Prior research on sentence intonation has mainly been concerned with the prosodic difference between the declarative and interrogative sentence in Mandarin Chinese. As

a small pilot study, this study is intended to focus on the interrogatives used in map-task-type conversations, particularly the yes/no interrogative. This is because there are rich data of interrogatives between the Instruction Giver and the Instruction Follower. The interaction between the underlying tone of the last syllable of the interrogative at word level and the sentence intonation of the yes/no question at sentence level is an important aspect of this study.

In this section, the taxonomy of questions in Mandarin Chinese is discussed at the start, and then syntactic structures are described by using examples from the eight map-task-type conversations. This serves to provide a basic understanding of what each classic question type in Mandarin Chinese is like when used in real-life interaction, which will pave the way for further analyses of the role of prosody of interrogatives in the turn-taking mechanism in Mandarin Chinese conversation. In this study, the terms ‘interrogatives’ and ‘questions’ are used interchangeably.

### **3.4.1 Interrogative taxonomy**

When it comes to the classification of questions in general, Cruttenden (1997: 155) states that interrogatives fall basically into two major classes: yes/no interrogatives and question word interrogatives. From the speaker’s perspective in interaction, question word interrogatives ask for information in a more general way whereas yes/no interrogatives ask for the truth of a proposition. The apparent advantage of Cruttenden’s interrogative taxonomy is that according to his work question-word interrogatives and yes/no interrogatives are almost universal among world languages. The comparison of the role of prosody in talk-in-interaction across languages is easier if this classification is

adopted. On the other hand, the disadvantage is that questions in different languages may have distinct features in terms of prosody and syntax, which are particular to specific languages. In other words, this classification cannot capture language-specific features of interrogatives.

From a cross-linguistic perspective, the categorization of interrogatives may vary from language to language. This study follows Li and Thompson's (1981) classification, who suggest that there are four types of questions in Mandarin Chinese: question-word questions, disjunctive/choice questions, tag questions and particle questions. Their classification of interrogatives is based on the syntactic and pragmatic features of Mandarin Chinese. For instance, they claim that the tag/echo question in Mandarin Chinese constitutes an independent category of questions, because tag questions are functionally different from the other types of questions in pragmatic contexts. The advantage of Li and Thompson's categorization is that it is relevant to the characteristics of the Chinese language and takes into account the syntactic features such as the particle question and the pragmatic contexts such as the tag question. On the other hand, it seems that there are some problems with their taxonomy. For instance, it is hard to draw a line between the tag question and the particle question, as the tag question can have two syntactic forms or constructions: it may occur with the sentence final particle like *ma* or *ba*, or in the 'A-not-A' frame. That is to say, there is some overlap in this typology.

Following Li and Thompson's (1981) categorization, I consider question-word questions, disjunctive/choice questions, tag questions and particle questions as the four classic types of interrogatives in Mandarin Chinese for this study. In the subsequent

section, the syntactic form of each classic type of the interrogative is discussed with examples from my data.

### 3.4.2. Particle questions

The first classic type of question in Mandarin Chinese is the particle interrogative. This type is the most relevant to this study in the sense that the yes/no question is one of the important particle questions in Mandarin Chinese.

Compared with English, the particle question is particular to Mandarin Chinese. An interrogative sentential particle 吗 *ma* is added at the end of a normal declarative or imperative sentence, and *ma* functions as a question marker. Syntactically speaking, the question in Mandarin Chinese is identical to its counterpart statement in terms of word order. It is assumed that syntactic resources such as the question marker *ma* and prosodic resources such as the modification of the final pitch contour contribute to the recognition or identification of the interrogative form in Mandarin Chinese.

In Mandarin Chinese, various particles can be used at the end of yes/no questions. Chu (1998: 123-130) notes that only the particle *ma* carries interrogative force whereas 啊 *a*, 呀 *ya*, 吧 *ba*, 呢 *ne* and the like do not actually mark questions in their own right. They often occur at ends of questions, but this does not necessarily mean that they are question markers. Chu also argues that the interrogative force in those questions comes from some other sources. Li and Thompson (1981) regard the particle question as the question type that is one of the most commonly recognized yes/no questions in addition to 'A-not-A' questions in Mandarin Chinese. For these reasons, the *ma*-particle question is chosen as the representative of particle questions in Mandarin Chinese for this



study.

Considering the prosodic features of yes/no questions in English, Cruttenden (1997: 157) reports that the intonation of yes/no questions, whether co-occurring with morphological or syntactic marking or not, almost invariably has a ‘terminal rise’. He further states that the terminal rising intonation is also usual in yes/no questions in tone languages. For instance, a yes/no question in Hausa, an African tone language, has a final jump to an extra high level, whether the terminal tone is high or low. In other words, he suggests that yes/no questions have a default setting of rising intonation at the end of an utterance. One reason for this may be that yes/no questions typically ask for an opinion about the truth of a proposition. In the direction-giving interaction of the map-task-type, yes/no questions are employed to check and secure the understanding of the route description already given in the prior talk within the turn.

One instance is chosen from the map-task data to illustrate the syntactic construction of the classic type of the *ma*-particle question.

(3) From Turn 23, Group Two, 2004

看到 了 吗?

kandao le ma

see ASP QP

Have (you) seen (it)?”

This instance shows that one type of *ma*-particle question has the following syntactic

structure:  $\boxed{\text{VP+ASP+QP}}$ . When *ma* is produced at the end of the declarative 看到了, the mood is changed into the interrogative.

### 3.4.3. Disjunctive interrogatives

The second classic type of question in Mandarin Chinese is the disjunctive interrogative, also known as alternative or choice question. Li and Thompson (1981: 531) note that the ‘A-not-A’ pattern is a type of disjunctive question. The question is formed by reduplicating the main verb, and a negative morpheme 不 *bu* or 没 *mei* is inserted between the two identical verbs. Sometimes, 是不是 *shi bu shi* ‘COP + NEG + COP’ is inserted before the verb. In addition, the question with the morpheme 还是 *hai shi* ‘or’ is also one variation of disjunctive questions, but the morpheme is generally omitted. This type of disjunctive question conveys the choice between an affirmative sentence and its negative counterpart. The recipient is required to give an affirmation by saying 是 *shi* ‘yes’, 对 *dui* ‘correct’ or 好 *hao* ‘all right’, or provide a negation by saying 不是 *bu shi* ‘no’, 不对 *bu dui* ‘no’ or 不好 *bu hao* ‘no’. To sum up, there are three variations of disjunctive questions in Mandarin Chinese: (i) Verb + Negation + Verb, such as 有没有 *you mei you* ‘have + NEG + have’; (ii) 是不是 *shi bu shi* ‘COP + NEG + COP’ + Verb (or 是否 *shifou* ‘COP + NEG’); and (iii) VP + 还是 *haishi* ‘or’ + VP.

Consider the following instance of the disjunctive question.

(4) From Turn 12, Group Seven, 2004

是 不 是 个 ‘林地’ ?  
 shi bu shi ge lindi

COP NEG COP CLS woodlands

“Is (the landmark labeled) the ‘Woodlands’?”

The question in this example is the second variation of the disjunctive question suggested by Li and Thompson (1981). In this instance, the interrogative force is indicated by the syntactic structure of *是不是* *shi bu shi* ‘COP + NEG + COP’.

#### 3.4.4. Question word interrogatives

The third classic type of question in Mandarin Chinese is the question word interrogatives, which are also known as ‘wh-questions’ or special questions in general terms. Cruttenden (1997: 159) reports that the number of question words available varies from language to language, but the equivalent of ‘who’ and ‘what’ seem to be always used in world languages. The equivalent of almost every common question word in English can be found in Mandarin Chinese. For instance, ‘谁’ *shui* is equivalent to ‘WHO’; ‘什么’ *shenme* is equivalent to ‘WHAT’; ‘哪里’ *nali* is equivalent to ‘WHERE’; ‘为什么’ *weishenme* is equivalent to ‘WHY’; ‘怎样’ *zenyang* is equivalent to ‘HOW’; ‘多久’ *duojiu* is equivalent to ‘HOW LONG’; ‘多少’ *duoshao* is equivalent to ‘HOW MANY’; and ‘多远’ *duoyuan* is equivalent to ‘HOW FAR’.

Syntactically speaking, Cruttenden (1997: 159) observes that in English the question word is most frequently used in initial position. However, in Mandarin Chinese it is not in the initial position as in English but in the normal position for a constituent of the type it represents. In other words, the word order in question word interrogatives is identical to that in normative sentences such as declaratives, imperatives and exclamatory

sentences. This suggests that the interrogative force comes from other resources, as the basic types of sentences in Mandarin Chinese are identical in terms of word order. It means that lexical and prosodic resources might play some part in the recognition or identification of the question word interrogatives in general from the recipients' perspective.

Prosodically speaking, Cruttenden (1997: 159) reports that terminal falling intonation might be the dominant pattern for question word interrogatives in world languages. He also points out that it is possible for some languages to have both falls and rises for question word interrogatives.

The following instance illustrates the syntactic feature of a question word interrogative in my data.

(5) From Turn 4, Group Three, 2004

‘大猩猩’ 在 哪里？

daxingxing      zai      nali

Gorillas      be:in      where

“Where is (the landmark labeled) the ‘Gorillas’?”

This instance clearly shows that the question word interrogative has the following word order: **NP + VP + ADV (place)**. At the same time, the question word 哪里 *nali* ‘WHERE’ emerges at the end of the turn and the last syllable is the neutral tone. However, the question word ‘WHERE’ is located at the beginning of the utterance in its

equivalent in English translation. In other words, in English conversation, the recipient is able to recognize the interrogative force at the very beginning of the utterance. On the other hand, in Mandarin Chinese conversation, the recipient can identify the interrogative information in the middle or only at the end of the utterance, depending on the position of the constituent that the question word represents. This implies that in Mandarin Chinese the interrogative indication might not be displayed by moving the question word to the very beginning of the question with the help of the auxiliary verb. The interrogative information might be indicated by lexical items and/or prosody.

It should be noted that *zai*, in Mandarin Chinese, can be seen as a full verb in this study according to Li and Thompson (1981: 365).

### 3.4.5. Tag questions

The fourth classic type of question is the tag or echo interrogative in Mandarin Chinese. In English, Quirk (1975: 390) states that the English tag question is a further type of question, which indicates positive or negative orientation. Li (1998) suggests that English tag questions are usually in the form of yes/no questions and attached to the end of an indicative clause. For instance,

(6) It is Sunday today, isn't it?

(7) You aren't telling a joke, are you?

From instances (6) and (7), it can be seen clearly that the syntactic structure of the English tag question is operator + subject. In this syntactic construction, the tag seems to be sensitive to the syntax of the preceding main clause.

In Mandarin Chinese, the tag question is defined for this study as a short question,

which is attached to the end of a statement, asking for verification or confirmation. However, the categorization of the tag question in Mandarin Chinese is still under debate. Tang (1981: 238-239) claims that the Chinese tag question is a sub-type of A-not-A questions, whereas Chao (1968) and Li & Thompson (1981) argue that the Chinese tag question constitutes an independent category because tag questions fulfill different pragmatic functions. When the classic type of question is discussed here in terms of syntactic forms, the taxonomy of Li & Thompson's is followed. In other words, the Chinese tag question is viewed here as an autonomous category in its own right. However, when the prosodic features of interrogatives for marking transition-relevance places are investigated later in this study, the Chinese tag question will be regarded as a sub-type of yes/no questions like in English.

There are two common syntactic forms for the Mandarin Chinese tag question: A-not-A question or the particle question. It seems that A-not-A questions and the particle questions can be used interchangeably for the tag question. For instance, *是不是* *shi bu shi* 'COP + NEG + COP', *行不行* *xing bu xing* 'feasible not feasible', *对不对* *dui bu dui* 'right not right', and *好不好* *hao bu hao* 'good not good' can be attached to the declarative to get confirmation of the statement preceding it. Their corresponding particle question variations are *是吗* *shi ma* 'COP + QP', *行吗* *xing ma* 'feasible QP', *对吗* *dui ma* 'right QP', and *好吗* *hao ma* 'good QP'.

English is an intonation language, and the nuclear tone on the tag operator may be a rise or a fall. A rise is neutral and invites the recipient to decide whether the preceding proposition is true, whereas a fall invites the recipient to agree with the proposition.

In addition, Cruttenden (1997: 159) argues that some sort of rising tone or higher pitch is preferred for the tag question, just as it is for yes/no questions in general.

The following tag question from my data can be used to illustrate what the syntactic features of the classic Mandarin Chinese tag question are.

(8) From Turn 30, Group Seven, 2004

再 :: 再 往左 走, 往左 走 90 度。

zai zai wangzuo zou wangzuo zou 90 du

again again leftward walk leftwards walk 90 degrees

“Again:: Walk leftwards again. Walk leftwards at 90 degrees.

→ 是 不 是?

Shi bu shi

COP NEG COP

Is (what I have described) correct?”

This instance shows that the tag question follows the previous statements, which are used to describe the correct route for the Instruction Follower. The function of the tag question is to check and secure the recipient’s understanding of the instructions provided in the prior talk within the same turn.

### 3.4.6. Summary

This section has offered a brief description of the classic types of interrogatives in Mandarin Chinese by reference to their syntactic constructions. This study generally

follows Li and Thompson's (1981) classification of Mandarin Chinese questions.

In this study, the yes/no question is selected as a representative for interrogatives in Mandarin Chinese. This is due to the fact that the yes/no question simply requires either affirmative or negative responses such as 'yes' or 'no' from the recipients. In conversation analysis, the question-answer sequence is regarded as one of the most frequently used adjacency pairs in conversations. Additionally, yes/no questions are particularly pervasive in my data set, providing a large number of examples for detailed analyses.

The subsequent section presents a comparison between turn-internal and turn final yes/no questions in terms of syntactic and prosodic features with the evidence from the map-task data.

### **3.5. Turn-internal vs. turn-final yes/no interrogatives**

The purpose of this part is to help non-Mandarin readers conceptualize the prosodic features of the yes/no questions used in the middle of the turn and at the end of the turn. The key issue is whether prosody is employed as the primary linguistic resource to help the recipient project the turn-endings within the context of map-task-type conversations in Mandarin Chinese.

The yes/no question is the focus of this study. In contrast to the question-word question, the yes/no question requires only a simple confirmation affirmation or a negation. If the recipient does not give such a reply immediately, I must assume an interactional reason. If a next speaker does not take his/her turn, the current speaker will



resume. Two instances are selected to demonstrate the difference between the turn-internal and turn-final yes/no questions within the context of map-task-type conversations in Mandarin Chinese conversations.

The following extract comes from Group Five in the map-task-type conversations in Mandarin Chinese. In this extract, both the turn-internal and turn-final yes/no questions can be found. In addition, both of them have an identical lexical tone of the last syllable at the end of the question. These two questions are articulated by the same speaker, but they have different sequential contexts in the organization of turn-taking in conversations.

(9) From Turn 59 and 60, Group Five, 2004

D: 过 了 ‘柔柔 的 目光’, 向下。

guo le rourou de muguang xiangxia

pass ASP soft PT stares downwards

“Pass the ‘Soft Stares’, and (then walk) downwards.

→ 是 否 看到 右边 有 “瞪羚”?

shi fou kandao youbian you dengling

COP NEG see right have gazelles

“Do you see the (the landmark labeled) ‘Gazelles’ on the right?”

就是 在 ‘柔柔 的 目光’ 的 下面。

Jiushi zai rourou de muguang de xiamian

Just be:in soft PT stares PT under

Just under the ‘Soft Stares’.

下面： 大概： 5 厘米： 3 厘米 处，

xiamian dagai wu li san limi chu

under approximately five centi- three centimeter position

(It is) approximately five centimeters: three centimeters under (the ‘Soft Stares’).

→ 是 否 有 “瞪羚”？

shi fou you dengling

COP NEG have gazelles

“Is there (the landmark labeled) the ‘Gazelles’?”

Turn 60 C: 有。

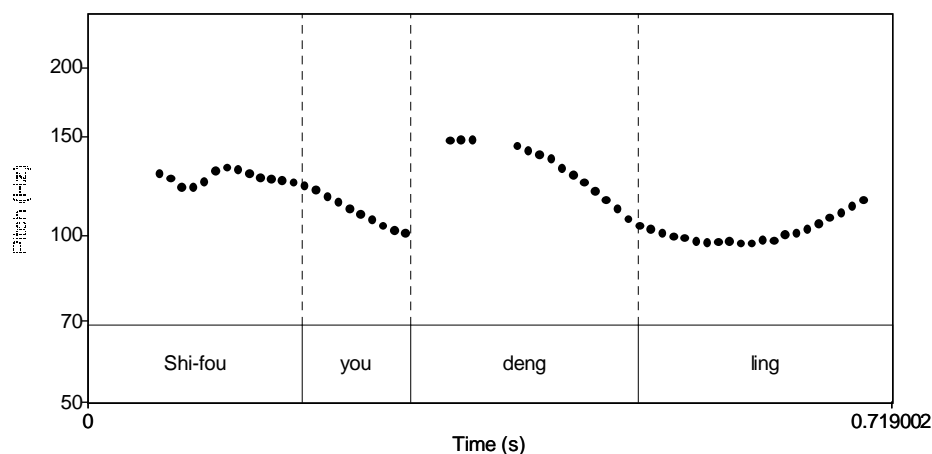
you

have

“Yes, there is.”

Two frequency analyses (see Graph 3.1. and Graph 3.2.) are shown below to display the pitch movement of the last syllable emerging within different sequential contexts.





Graph 3. 2 Turn-final rise in *dengling*

It is shown in Graph 3.2 that the pitch movement of the lexical tone of the last syllable at the end of this yes/no question is also evidently rising, as predicted by prior research. In this instance, the lexical tone of the last syllable of *ling* is Tone2 (35, rising). It demonstrates that the lexical tone may determine the pitch movement of the question intonation turn-finally.

Compared with the turn-internal yes/no question ending with the identical lexical items *dengling* “Gazelles”, the prosodic features of the turn-final yes/no question shown in Graph 3.2 are identical to those of the turn-internal question in Graph 3.1. The implication is that pitch contour alone might not play a dominant role in projecting turn finality by looking into the prosodic details of these two examples. It suggests that other linguistic resources such as lexical selection, syntactic construction, pause and their combination might carry some weight in the projection of possible turn completions as far as the recipient is concerned.

It is important to note that these two instances are consistent with prior research, i.e., the lexical tone of the last syllable of the question keeps its original tonal shape in Mandarin Chinese. This might imply that the sequential contexts such as turn incompleteness and turn endings may not contribute to the resultant pitch movement of the question intonation in the spoken data. However, my data will show this is not always the case (see Chapter 5). The pitch movement of the lexical tone of the last syllable at the end of the turn might behave differently from its original tonal shape.

### 3.6. Summary

Unlike in English, the word order of declaratives and yes/no interrogatives in Mandarin Chinese are identical. The only difference is that yes/no interrogatives have an extra grammatical particle at the end, namely *ma*. This suggests that other linguistic resources such as prosodic cues and the lexical item of the question particle might help recipients recognize and project the upcoming end of a turn.

For instance, in my map-task-type conversation, yes/no questions are frequently used as the first pair part in the adjacency pairs, as illustrated in (10).

(10) D: 完 了 吗 ?

wan le ma

finish ASP QP

‘Have you finished?’

A: 画 完 了。

hua wan le.

draw complete    ASP

“Yes, I have completed drawing.”

In this example, Speaker D (Instruction Giver) initiates the yes/no question to bring the current turn to completion, and Speaker A (Instruction Follower) provides a statement without using the first person pronoun *wo* (我) “I” as the subject to giving a definite answer. When the interrogative utterance ending with the last toneless syllable *ma* interacts with the question intonation, what is the resulting pitch contour at the end of the yes/no interrogative? On the other hand, when the last syllable *le* with the neutral tone at the end of the declarative interacts with the sentence intonation, what is the resulting pitch movement at the end of the statement? How the last syllable with neutral tone interacts with the stressed syllable preceding it and with the sentence intonation is an interesting research question. For the recipient’s part, prosodic resources like the pitch movement might contribute to the accomplishment of projecting possible turn completion.

One of the immediate aims of this study is to investigate whether there is correlation between certain types of pitch movement such as falling, rising and level and the conversational activity type such as turn completion within the context of map-task-type conversations in Mandarin Chinese. The descriptions and analyses of prosody of the yes/no interrogative at turn-final places and turn-internal places may facilitate the understanding of the role of prosody in Mandarin Chinese conversation.

Regarding most non-tone languages, the use of fundamental frequency in prosody is

not so complex as that of a tone language like Mandarin Chinese. Therefore, this chapter has aimed to present some basic knowledge concerning the syntactic structures of the classic type of interrogatives used in Mandarin Chinese. The next chapter will detail the methods of data collection (i.e., the Map Task) and of data analysis (i.e., instrumental analysis).

## 4. RESEARCH METHODS

The conversation analysis framework involves a number of methodological tenets, which are concerned with what constitutes acceptable data and what constitutes acceptable evidence. As far as data are concerned, “priority is given to naturally occurring talk as a means of reconstructing members’ prosodic devices for achieving their conversational goals” (Couper-Kuhlen and Selting 1996:25). The term “natural conversation” is meant to contrast the data to that obtained from reading sentences under conditions such as experiments, where data production is controlled in several ways.

The importance of using natural data for research of conversation has been emphasized by a number of investigators. For instance, Condon and Ogston (1967: 221) argue that:

the need to control the variables in experimental method tends to modify the process under investigation. In human behaviour, it is quite often not even clear what the variables are, such that they could be controlled. What is required to some extent is a method which could investigate and make relatively rigorous, predictable statement about a process without disrupting the process too severely.

Furthermore, they note that “naturally occurring processes are, theoretically, as determined as the events in a controlled experimental situation.”

An emphasis on the importance of natural data is not confined to analysts of human



interaction. It has come to be recognized in linguistics, through the work of Labov, among others, that the study of a language requires data from the actual situations of everyday life. Labov (1972: xiii) states that:

there is a growing realization that the basis of inter-subjective knowledge in linguistics must be found in speech---language as it is used in everyday life by members of the social order, that vehicle of communication in which they argue with their wives, joke with their friends, and deceive their enemies.

Labov's theories about the type of data appropriate for the study of speech were a strong influence on the naturalistic approach to data collection in this study. The data for this study consist of conversations recorded through the method called the Map Task. The strengths and limitations of this method are discussed below.

#### **4.1. Map Task**

The Map Task (Anderson et al. 1991) procedure for collecting spontaneous speech has been used in this study. The Map Task, developed by the Human Communication Research Centre at University of Edinburgh and Glasgow, is a widely accepted tool in the study of dialogue, because it allows researchers to study conversations that are somewhat spontaneous and yet structurally consistent. The tasks work as follows: two participants each have a map showing a variety of pictured landmarks with labels such as "Missionary Camp" or "White Mountain". The maps may differ slightly in detail; crucially, one map

(the Instruction Giver's map) has a route marked on it, whereas the other (the Instruction Follower's map) does not. Neither participant can see the other's map. It is, however, up to them to discover how the two maps differ. Specifically, eye contact is not allowed during the whole process; all conversations are tape-recorded. Four native Mandarin speakers between 20 and 22 years old from Hunan University in China were the participants in this study.

#### **4.1.1. Strengths of Map Task**

The map tasks follow the model (Anderson et. al. 1991) in which two participants cooperate to accomplish a common goal. The task involves verbal co-operation between two participants, each having a map, with the aim of transferring as accurately as possible a given route from one map to the other step by step. Difficulties emerge in the task, when a number of landmarks are either absent or differently positioned on one of the maps.

The major strength of the Map Task is that the data produced by the participants contain "natural" conversation, despite the fact that the dialogues are guided by the landmarks along the route in the map. Also, the topic is confined to the descriptions of the correct route. For the purposes of this study, the data from the Map Task are appropriate because the prosody of an individual remains almost the same either in the task-oriented conversation or casual conversation without the limitation of the topic. In other words, the speakers produce the prosody in connected speech when they collaborate to complete their tasks verbally, rather than the prosody being generated in an elicited environment by reading isolated sentences aloud.

### 4.1.2. Limits of Map Task

To some degree, map tasks are not equal to ordinary talk in everyday settings since there are three limits of naturalness in map-task conversations. Firstly, the map-task conversations are conducted in the setting of a language laboratory, with tape recording equipment around the speakers; sometimes a video camera is used to record gestures, gaze, head motions, and body movement. All these will have a psychological impact on participants, which in turn affects their verbal communication. From an experimental point of view, the experimenter controls and manipulates participants by giving them directions. For example, participants are told not to exchange eye contact during the map-task conversations in order to exclude factors such as gaze and head movements. Thus, the task-oriented conversations are not entirely natural in that they are under the control of the experimenter in the language laboratory.

Secondly, the map-task dialogues are distinct from natural and spontaneous speech in that the Instruction Giver tends to dominate the whole process of fulfilling the goal, while the Instruction Follower is in a passive position and interrupts occasionally if the landmark in his own map does not exist. This is similar to the relationship between teacher and student in a traditional classroom communication. All these factors affect the naturalness of the conversation to some extent because the participants are aware of their roles and their turn management changes accordingly.

Last but not least, another limit of the map-tasks is that the intention has an influence on the participants' verbal production. Specifically, the presence of intention affects the conversation in a sense of more carefulness in choosing the appropriate lexical items and

syntactic constructions. For instance, the participants tend to restrict their expressions to a range of words in the domain of direction (e.g., left or right), and distance (e.g., five centimeters upwards or three centimeters downwards), and the location of the landmark which is absent from one participant's map. Additionally, the majority of the sentences are imperatives from the Instruction Giver.

## **4.2. Research design**

The Map Task has also been used by other researchers in the field of conversation analysis. For instance, Caspers' (2003) research on the role of local melody in the turn-taking system in Dutch is based on her eight Dutch map-task-type Corpus.

### **4.2.1. Procedure**

The research has been done in the following order. As the first step, the conversations were recorded in the Student Computer Room in the Building for the College of Foreign Languages, Hunan University, on 20th September, 2004. Four speakers participated and eight conversations were recorded. The speakers were all junior students studying at Hunan University, China. The maps were based on the original HCRC (the Human Communication Research Centre at University of Edinburgh and Glasgow) Map Task. The distribution of the landmarks and the route on the Information Giver's map were identical to the originals, but the actual labels of the landmarks on both the Information Giver's and Follower's maps were translated into Mandarin Chinese.

Secondly, from the recordings, preliminary transcriptions were made to have an

overview of all the eight conversations. They were rough drafts, which laid a foundation for the next step of the study.

Finally, the episodes to be analyzed were selected from the preliminary transcriptions on the grounds of a variety of considerations and perspectives. The relevant transcriptions had to be checked repeatedly for accuracy, and they will be cited below as examples in the section on results and discussion (see Chapter 5).

#### 4.2.2. Subjects

Four participants from Hunan University, in China, were involved in the eight map task conversations, as illustrated in Table 4.1.

Table 4. 1 Subject details

Speaker	Sex	Age	Birth Place
A	Male	22	Changsha, Hunan, China
B	Female	20	Hengyang, Hunan, China
C	Female	20	Changsha, Hunan, China
D	Male	21	Yincuan, Ningxia, China

Subjects are necessarily paired for the task. Since the pairing is under the experimenter's control, it is possible to vary systematically the familiarity between the participants, by asking subjects to attend with a friend. Each pair of familiar subjects was tested in coordination with another pair who was unknown to either member of the first pair. Two pairs formed a quadruple of subjects who used among them a different

set of four map-pairs, with maps being assigned to pairs by Latin Square. Each subject participated in four dialogues, twice as Instruction Giver and twice as Instruction Follower. As Instruction Givers, they gave directions on the same map, but when following they used different maps each time.

In order to avoid gestures and eye contact during the conversation, subjects sat three or four feet apart, facing each other across a desk, with their maps placed on sloping boards, to prevent each subject seeing the other's map. Subjects were not allowed to have eye contact with their partners. To preserve the participants' anonymity, all names in the map-task-type conversations have been changed to A, B, C, and D.

It should be noted that the variety of Mandarin Chinese spoken by the participants is a relevant issue for this study, particularly in the case of classification of unstressed neutral-tone syllables in the compound words. The four participants studied at Hunan University from 2001 to 2005. One came from Ningxia, a northern province in China, and the other three students were from Hunan, a central province in China. They do not speak Beijing Mandarin, which has a relatively prominent neutral-tone phenomenon in the spoken form. However, most speakers from Hunan acquire Mandarin Chinese from school textbooks and they learn how to use neutral tone in the second syllable of compound words from their Chinese teachers. In this sense, the textbook on the standard Mandarin Chinese pronunciation is very crucial. On the other hand, the dialect in Hunan Province tends to have some impact on their use of neutral tone of the unstressed syllable in the compound words.

We cannot ignore the fact that the majority of speakers come from Hunan Province,

and Hunan dialects may affect the findings concerning Mandarin Chinese for this study. For instance, they have some difficulty in producing neutral one in some disyllabic compounds. On the other hand, the four participants in this study are well-educated university students who can speak Mandarin Chinese fluently and can communicate with people from all parts of China successfully. It is worthy of note that there are numerous dialects in China and dialects will not affect speakers significantly when they communicate in Mandarin Chinese. This is the same case for speakers of English who speak some dialects.

#### 4.2.3. Data

In total, there are eight task-oriented dialogues amounting to approximately one hour, and the details of the eight dialogues are as illustrated in Table 4.2.

Table 4. 2 Data details

Dialogue	Group Number	Instruction Giver	Instruction Follower	Number of Turns	Duration (minutes)
1	One	Speaker A	Speaker B	52	7:46:28
2	Two	Speaker C	Speaker D	67	9:05:21
3	Three	Speaker D	Speaker A	106	12:53:58
4	Four	Speaker B	Speaker C	25	4:32:79
5	Five	Speaker D	Speaker C	62	7:05:51
6	Six	Speaker B	Speaker A	53	7:29:64
7	Seven	Speaker A	Speaker D	64	8:21:31
8	Eight	Speaker C	Speaker B	35	4:48:60

In addition, the equipments deployed in this recording are as follows: ECM-MS907, SONY ELECTRET CONDENSER MICROPHONE, and the computer software Cool Edit Pro 2.0 helps transfer the sounds into the WAV form simultaneously.

Below are two sample pictures illustrating the content of the Instruction Giver's map in Figure 4.1 and that of the Instruction Follower's map in Figure 4.2. In total, sixteen pictures were used in the eight conversations.



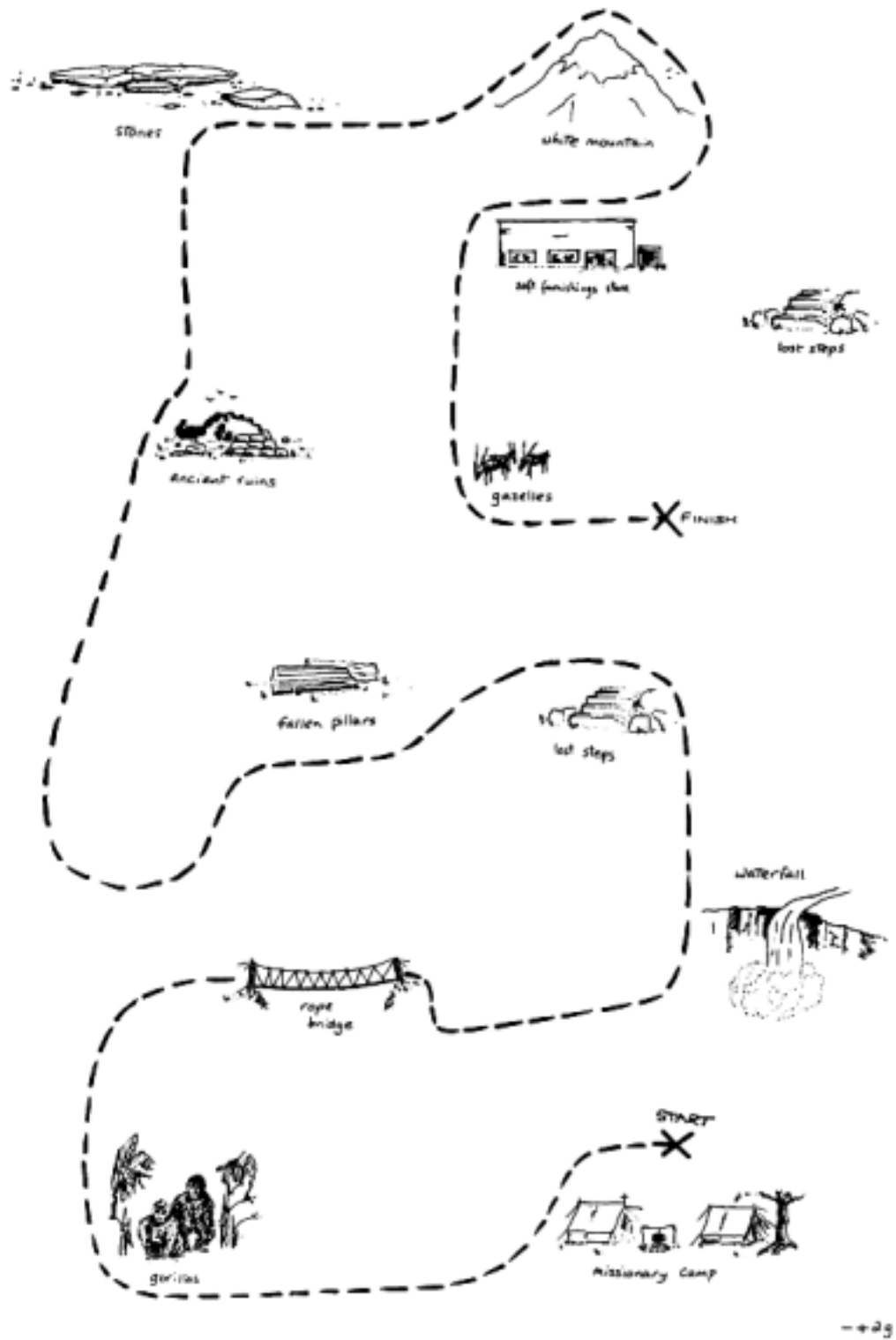


Figure 4. 1 Sample for Instruction Giver's map

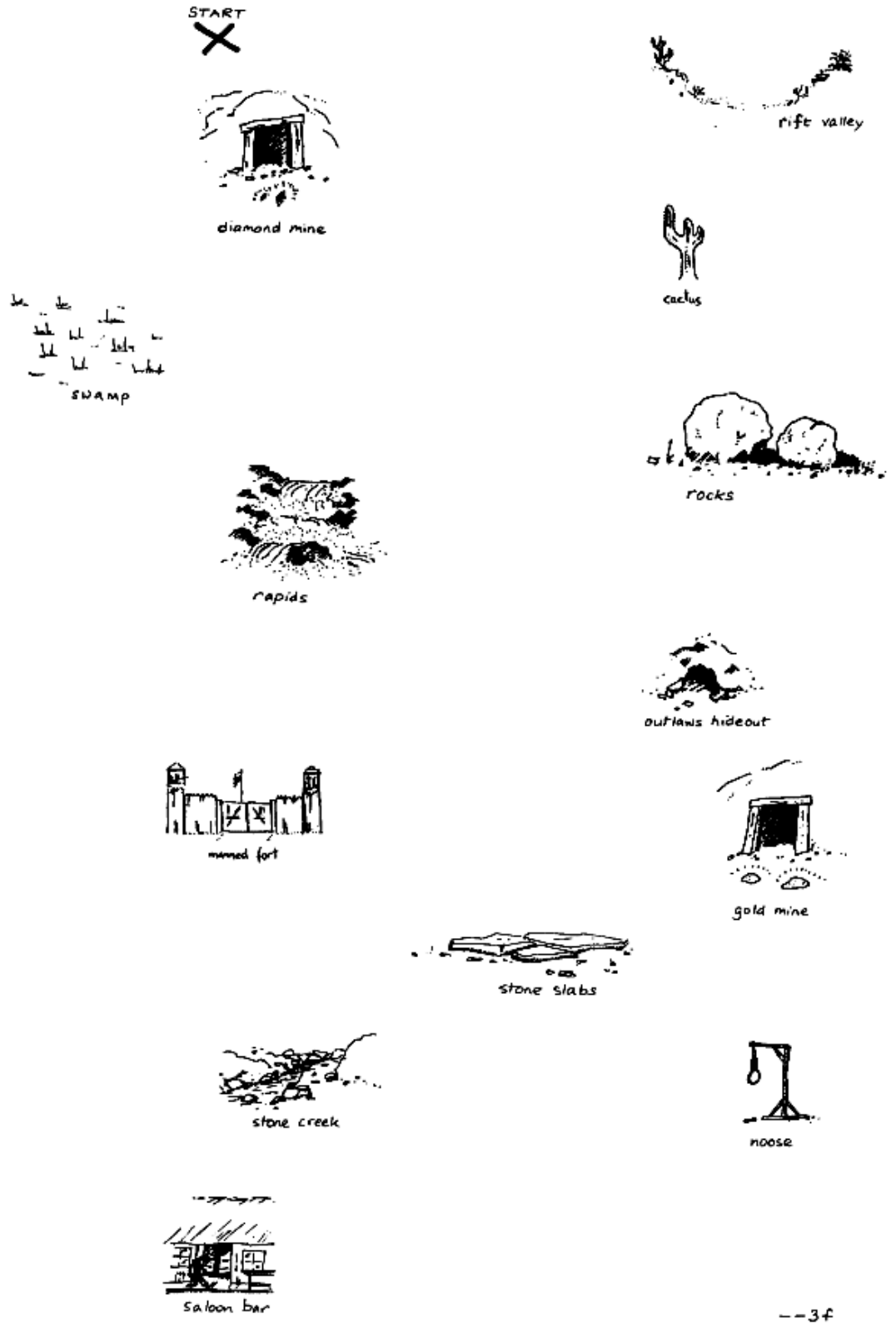


Figure 4. 2 Sample for Instruction Follower's map

### 4.3. Instrumental analysis

Studies of prosody differ considerably in their approaches, and particularly in the type of analysis they use. In this study, the instrumental analysis plays a dominant role; the Praat program version 4.4.28 for phonetic analysis is used to generate frequency analysis of pitch patterns.

Advances in speech technology benefit researchers in a number of ways. Firstly, for some aspects of the study of prosody in conversation, instrumental analysis is essential: measurements of average pitch range, for instance, or relative change are otherwise far too cumbersome. Automatic analysis can also make larger quantities of data available than time-consuming auditory analysis will allow. Secondly, the same principles that underlie instrumental analysis also make it possible to manipulate speech data. To illustrate, the pitch contours of a recorded sentence can be modified in order to test changes in perception.

On the other hand, instrumental analysis has its limitations. The first limitation is that some types of data are not readily amenable to instrumental analysis, such as overlapping speech. Also, an instrumental analysis is not necessarily more 'correct' than an auditory one, because physical events and perceived linguistic structures are not necessarily directly related. Just as in music, the absolute duration of a pause in milliseconds, for example, may be less relevant than its relation to the perceived rhythmic beats (Couper-Kuhlen 1993). A level tone may be anything but level if the  $F_0$  contour on the screen is examined. Another limitation is that the computer cannot make a distinction between events that are linguistically significant and those that are not.

Finally, since each speaker uses a slightly different pitch range, direct comparisons between speakers cannot easily be made instrumentally. Pitch patterns have to be normalized before such comparisons can be made.

#### **4.4. Summary**

In this study, the Map Task is deployed to obtain task-oriented dialogues, which lays a foundation for this research. Building on the small-scale data, instrumental analysis is adopted. In addition, the speech software program Praat is used to carry out the instrumental analysis of the prosody of turn-internal and turn-final interrogatives, and the analysis of turn-final declarative intonation in Mandarin Chinese conversation. The next chapter will present the results of the instrumental analysis of the prosody of turn-internal and turn-final interrogatives and turn-final declaratives, along with some discussions.

## 5. RESULTS AND DISCUSSION

This chapter has four subsections: (i) the prosodic characteristics of *ma*-particle questions, including discussion of the interplay between the lexical tone of last toned syllable and the pitch movement of the *ma*-particle question; (ii) the prosodic characteristics of the ‘A-not-A’ yes/no question, followed by a discussion of the interaction between the lexical tone of the last toned syllable and the final pitch movement of the yes/no interrogative; (iii) the analysis of the final pitch of turn-final declaratives; and (iv) the comparison between turn-internal and turn-final yes/no questions.

The focus of this study is the pitch movement of the last accented syllable in the last prosodic unit in a yes/no question. Other prosodic parameters such as duration, volume and voice quality are not investigated in this study.

Szczepek Reed (2004: 97) defines turn-final intonation as “the intonation pattern starting on the last accented syllable of a turn-at-talk, and continuing throughout this syllable, and potential unstressed syllables following it, to the end of the turn.” This definition is adopted here for interrogatives in Mandarin Chinese. Jin (1992) argues that the pitch movement of the accented syllable of the last prosodic unit of the utterance contributes to the intonation of Mandarin Chinese. This suggests that the last accented syllable plays a key role in the makeup of the final pitch movement of the yes/no interrogative.

Shen (1994: 226) states that the interrogative intonation is the combination of two

different features: the top pitch line drops abruptly and the bottom pitch line rises slightly. Put simply, the typical interrogative intonation displays a fall-rise pattern in Mandarin Chinese. It is worth noting that the classification of a rise and a level in connection with the pitch movement of the last syllable of the interrogative is sometimes difficult. In the analysis of my data, from the acoustic perspective, the first step is to measure the highest and lowest  $F_0$  value of the individual syllable in the yes/no interrogatives. Provided that the gap between the highest and lowest  $F_0$  is less than 10 Hertz (including 10 Hertz), the pitch movement can be classified as a level. If the difference is more than 10 Hertz, the pitch contour can be seen as a rise. For instance, one yes/no question from Group Two is 看到了吗? In this example, the measurement of the highest  $F_0$  is 197 Hertz, and the lowest  $F_0$  is 190 Hertz. As a result, the difference is 7 Hertz for the syllable of *ma*, and the pitch contour can be defined as level. Throughout this study, this classification approach of a rise and a fall is followed in the analysis of *ma*-particle and A-not-A questions, as well as declaratives.

From the perceptual perspective, the second step is to use the human ears to double check and confirm whether a level intonation sounds like a real level. All these two steps are strictly followed in this study.

### **5.1. Prosodic characteristics of the *ma*-particle question**

In the first subsection, the prosodic characteristics of the yes/no question with *ma* are discussed with exemplifications from our data.

### 5.1.1. Pitch patterns of the *ma*-particle questions

An investigation of the 62 yes/no questions ending with *ma* shows that there are six different question intonation patterns in the middle or at the end of a turn: fall-rise, fall, fall-level, rise-fall, level-rise, and rise.

In the subsequent section, these six types of pitch contours at the end of the *ma*-particle questions will be illustrated.

#### 5.1.1.1. Fall-rise

According to Shen (1994), the fall-rise is the typical interrogative intonation in Mandarin Chinese. This type of pitch pattern can be found in the data.

Example 1: 完成了吗 (Turn 63 in Group 2)

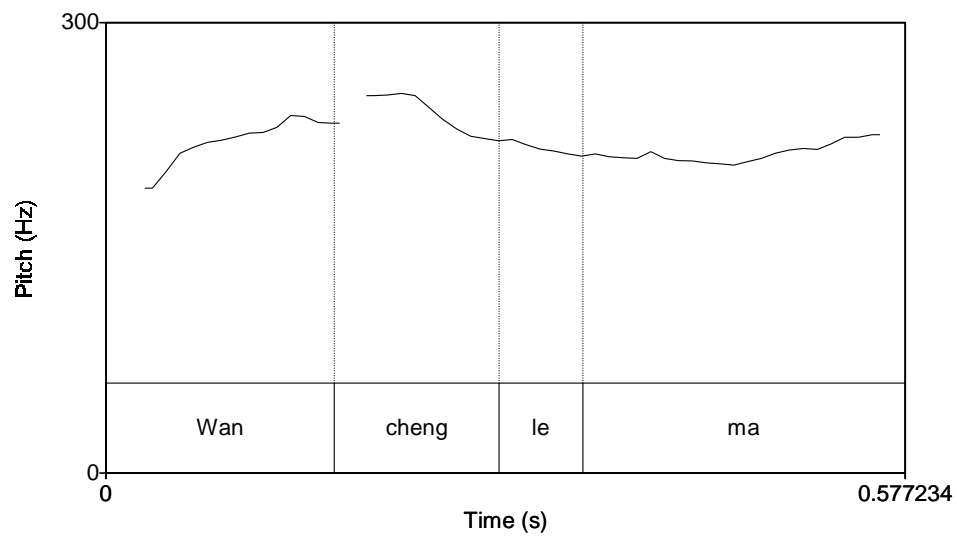
This instance of a fall-rise comes from Group Two in the middle of Turn 63, articulated by the Instruction Giver.

(1) 完 成 了 吗 ?

wancheng le ma?

finish ASP QP

“(Have you) finished (it)?”



Graph 5. 1 Non-final fall-rise in *cheng le ma*

The frequency analysis in Graph 5.1 shows that the pitch reaches the highest point on the syllable of *cheng* in the yes/no question and drops to the lowest point on the syllable of *le*. At the last part of the pitch movement, the pitch rises slightly till the end of the question. This instance is in line with Shen's (1994) description of the interrogative intonation in Mandarin Chinese. The citation tone of the syllable of *cheng* is supposed to be rising (35), but it is delivered as falling in the above question.

#### 5.1.1.2. Fall

Falling intonation is assumed to be the typical declarative intonation in Mandarin Chinese. Shen (1994) argues that both the top pitch line and the bottom pitch line drop for declaratives in Mandarin Chinese. However, falling intonation is quite frequently used for yes/no questions ending with *ma* in my data.

Example 2: *完毕吗* (Turn 61 in Group 5)



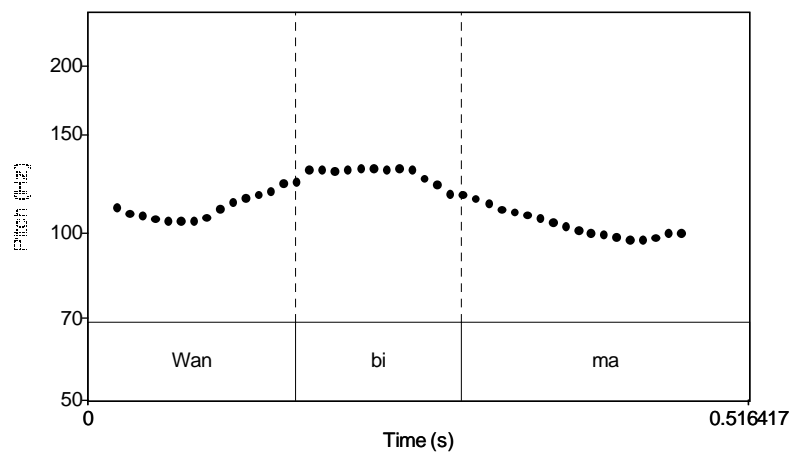
This instance of falling intonation comes from Group Five at the end of Turn 61 and at the end of the overall conversation, produced by the Instruction Giver.

(2) 完毕 吗?

wanbi ma

finish QP

“(Have you) done (it)?”



Graph 5. 2 Turn-final fall in *wan bi ma*

The frequency analysis in Graph 5.2 shows that the highest pitch appears on the syllable of *bi* and retains unchanged, but the pitch drops on the last syllable of the toneless *ma*.

This instance shows that it is likely for the yes/no question ending with *ma* particle to have a terminal fall.

Shen (cited in Lin 2004: 58) reports the intonation of the yes/no questions in Beijing dialect as: “the pitch starts from the middle or high point in the pitch range, and then rises to the highest and drops slightly, and finally ends in the low pitch range.” This instance

shows that the pitch movement of *ma* is consistent with that of the yes/no question in Beijing dialect.

### 5.1.1.3. Fall-level

Fall-level is also common in the data. The pitch of the accented syllable reaches the highest point and drops gradually. Instead of going up in the typical interrogative intonation, the pitch remains level till the end of the yes/no interrogative.

Example 3: *成了吗* (Turn 63 in Group 2)

This instance of falling-level intonation comes from Group Two at the end of Turn 63, produced by Instruction Giver.

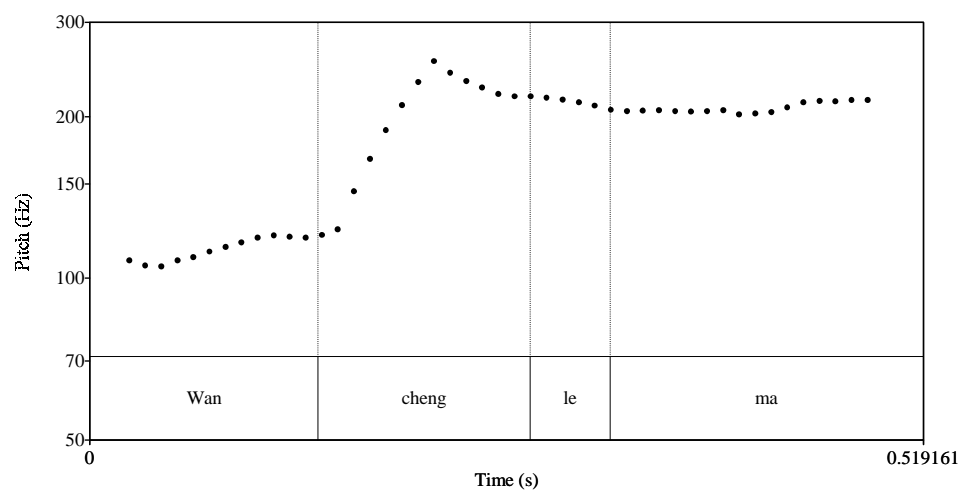
(3) 

完	成	了	吗	?
---	---	---	---	---

wancheng          le          ma?

finish              ASP          QP

“(Have you) done (it)?”



Graph 5. 3 Turn-final fall-level in *cheng le ma*

The frequency analysis in Graph 5.3 shows that the pitch reaches the highest point and drops on the syllable of *cheng* (35 mid-rising), and then continues to fall gradually on the unstressed toneless syllable of *le*, an aspect marker. However, the pitch becomes a level, contrary to Shih's (1987) description of a fall. In fact, the pitch movement of the toneless syllable is unspecified, and the pitch of the preceding syllable or the interrogative intonation might have some effect on its surface realization in naturally occurring conversation.

While the above patterns are the most frequently occurring ones in my data, instances of rise-fall, level-rise, and rise intonation patterns are also present (see below).

#### 5.1.1.4. Rise-fall

Only two instances of fall-rise intonation are available in my data.

Example 4: 海湾吗 (Turn 40 in Group 7)

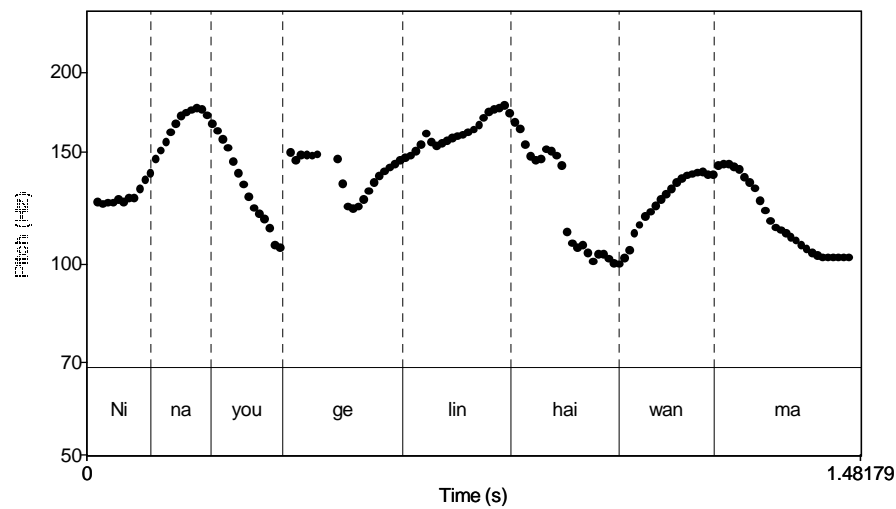
This instance of rising-falling intonation comes from Group Seven at the end of Turn 40, produced by the Instruction Follower.

(4) 你 那 有 “格林海湾” 吗?

ni na you gelin haiwan ma

2SG there have green: bay" QP

“Do you have the ‘Green Bay’ on your map?”



Graph 5. 4 Turn-final rise-fall in *haiwan ma*

The frequency analysis in Graph 5.4 shows that the pitch reaches the lowest point on the syllable of *hai* and rises on the syllable of *wan*, but drops on the last syllable of *ma* instead of going up. This is different from the terminal falling intonation over the last accented syllable and the following toneless syllable. As a result, it can be seen as a type of pitch pattern of the *ma*-question.

#### 5.1.1.5 Level-rise

Only three instances of level-rise intonation are available in my data. Consider the following instance.

Example 5: 明白了吗 (Turn 17 in Group 2)

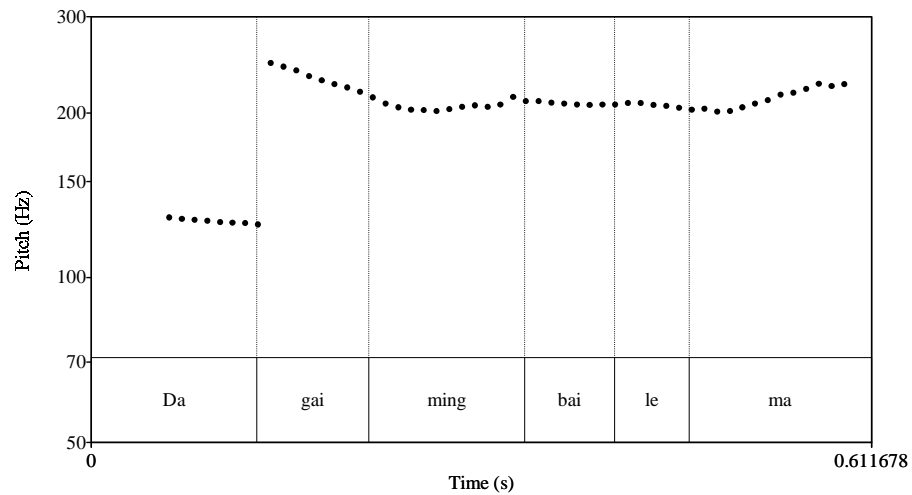
This instance of level-rise intonation comes from Group Two at the end of Turn 17, produced by the Instruction Giver.

(5) 大概 明白 了 吗?

dagai mingbai le ma?

roughly understand ASP QP

“(Do you) roughly see (what I mean)?”



Graph 5.5 Turn-final level-rise in *mingbai le ma*

The frequency analysis in Graph 5.5 shows that the last accented syllable of *ming* displays a level intonation and remains level over the last toneless syllables of *bai* and *le*, but the pitch rises gradually till the end of the yes/no interrogative.

#### 5.1.1.6. Rise

Only two instances of rising intonation are available in my data. Consider the following instance.

Example 6: “墙”了吗 (Turn 15 in Group 8)

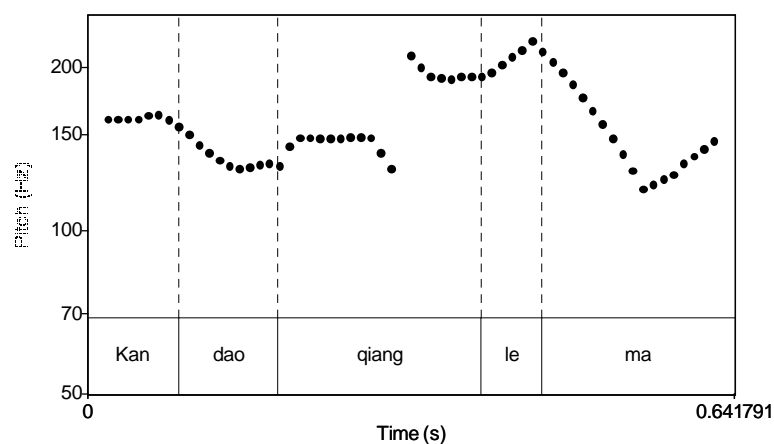
The instance of the rising intonation comes from Group Eight in the middle of Turn 15, articulated by Instruction Giver.

(6) 看到 “墙” 了 吗?

kandao      qiang      le      ma

see          wall      ASP      QP

“Have you seen the ‘Wall’?”



Graph 5. 6 Non-final rise in *qiang le ma*

The frequency analysis in Graph 5.6 shows that the pitch rises over the syllables of *qiang* and *le* in the top pitch line, and it also rises over the syllable of *ma* from a low pitch point. However, this is not the dominant pitch movement in the data of this study.

For non-tone languages, Cruttenden (1997: 156) points out that the intonation of yes/no questions, whether co-occurring with morphological or syntactic marking or not, almost invariably occurs as a ‘terminal rise’. He further states that the terminal rising intonation is also usual in yes/no questions in tone languages. However, the rising intonation over the last accented syllable and the following toneless syllables rarely emerges at the end of the yes/no question in the data (3 per cent).

#### 5.1.1.7. Summary

An examination of the 62 yes/no questions has shown that the pitch reaches the

highest point over the last accented syllable and then it rises, remains level or falls over the following toneless syllables in the majority of instances of yes/no questions in the map-task-type conversations.

The distribution of the six types of pitch movement of the accented syllable and the following toneless syllables can be illustrated in Figure 5.1.

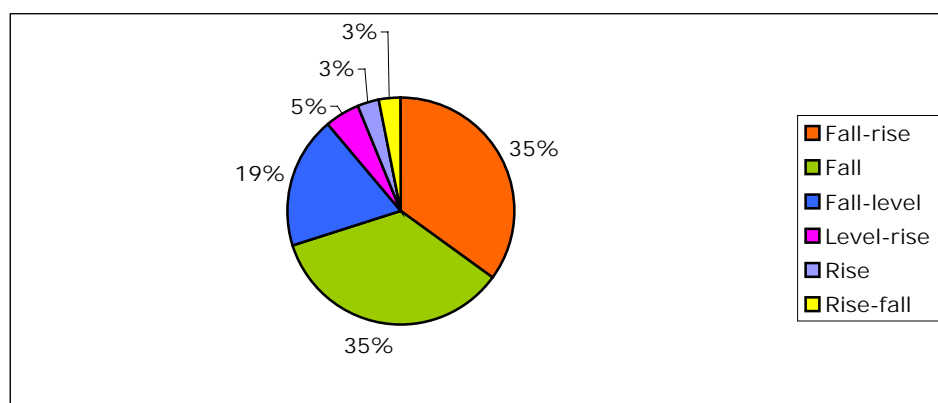


Figure 5. 1 Distribution of the pitch movement of the *ma*-particle question

The results of the examination into the pitch movement of the accented syllable and the following toneless syllables of the 62 yes/no questions in the map-task-type conversations are as follows.

- 35 per cent of *ma*-particle questions end with a fall-rise;
- 35 per cent of *ma*-particle questions end with a fall;
- 19 per cent of *ma*-particle questions end with a fall-level;
- 5 per cent of *ma*-particle questions end with a level-rise;
- 3 per cent of *ma*-particle questions end with a rise;
- 3 per cent of *ma*-particle questions end with a rise-fall.

The typical interrogative intonation of fall-rise as described by Shen (1994) has been found in my data. 22 out of 62 instances of *ma*-particle questions display a fall-rise intonation, accounting for 35 per cent of the yes/no questions ending with *ma*.

On the other hand, five other types of pitch movements have also been observed in the final accented syllable and the following toneless syllables: fall-level, fall, level-rise, rise-fall and rise. The observation suggests that it is possible for the yes/no question ending with *ma* to have different types of pitch movement in addition to the typical fall-rise interrogative intonation.

The most interesting point is that the number of the instances with falling intonation of the final accented syllable and the following toneless syllables is exactly the same as that of falling-rising intonation. This suggests that falling intonation is also an important type of interrogative intonation in Mandarin Chinese. While Shen (1994) claims that falling intonation is the typical declarative intonation in Mandarin Chinese, Shen (1990) describes that the yes/no questions in Beijing dialect may have the falling intonation.

The evidence from the map-task conversation shows that it is likely for *ma*-particle questions to have a fall-rise or a fall as their intonation pattern.

### **5.1.2. The pitch movement of the final syllable *ma***

Provided that the focus is only on the pitch movement of the final syllable *ma*, the pitch pattern can be reduced to rise, fall and level. The distribution of the three pitch movements of the last syllable *ma* in the yes/no question is illustrated in Figure 5.2.



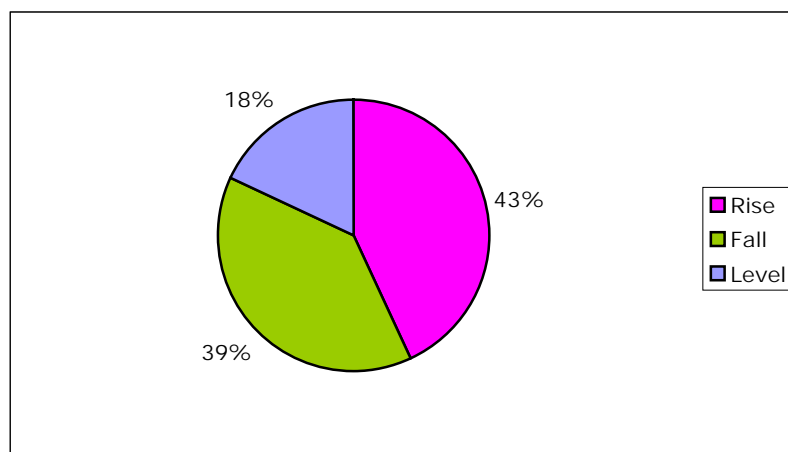


Figure 5. 2 Pitch movement of the final syllable of *ma* in the yes/no questions

The results of the pitch movement of the last syllable of *ma* in the yes/no question in the map-task-type conversations are as follows.

- The last syllable *ma* in 43 per cent of particle questions displays a terminal rise;
- The last syllable *ma* in 39 per cent of particle questions displays a terminal fall;
- The last syllable *ma* in 18 per cent of particle questions displays a terminal level.

The results demonstrate that terminal rising intonation has the highest percentage in the total of 62 yes/no questions ending with *ma*. The rising pitch contour is in line with Cruttenden's (1997: 157) claim concerning the pitch movement of yes/no questions. He suggests that a terminal rise is usually the common intonation phenomenon for the yes/no question in the tone languages.

On the other hand, the final syllable of *ma* can also display the falling pitch, 4 per cent less than the rising pitch. This suggests that falling is also an important pitch movement of the yes/no question. This finding is not consistent with the previous research on the yes/no question in Mandarin Chinese.

Furthermore, a level is also possible for the yes/no question with *ma*, accounting for 18 per cent. We tentatively suggest that a terminal level is a new finding in research on the intonation of the yes/no questions with *ma* in Mandarin conversation.

### 5.1.3. Effect of the preceding toned syllable on following toneless syllables

The lexical tone of the toned syllable makes the greatest contribution to the pitch pattern of the *ma*-particle question. We make some attempts to discuss the issue by using the data from the map-task-type conversation.

The neutral tone of *ma* is a toneless syllable, and its tone value is therefore unspecified. Its pitch movement has a range of variations depending on the preceding syllable in various contexts. In the yes/no interrogative, *ma* is located at the end of the question. In addition, the pitch contour of the toneless syllable of *ma* may also be affected by the question intonation which emerges in the final region of the whole utterance.

In the region of the final syllable, the conflict between the lexical tone from the preceding toned syllable and the interrogative intonation is resolved. On the one hand, the tonal shape of the toneless syllable *ma* depends on the preceding syllable. On the other hand, the interrogative intonation emerges in the region of the final syllable and affects the pitch track of the toneless syllable to some extent. It seems that the lexical tone and the interrogative intonation may have some hierarchy in their realization and arrive at a sort of harmony in the end.

There is some literature concerning the prosodic features of the toneless syllable. Yip (2002: 181) suggests that neutral tone has an underlying low tone and these toneless

syllables surface with a variety of tones depending on the tone of the preceding syllable. In another study, Shih (1987) studies the phonetic features of the neutral tone with different preceding citation tones and reports his findings, cited in Yip (2002: 181) and illustrated in Table 5.1.

Table 5. 1 Phonetic features of the toneless syllable after the toned syllable

Preceding tone	Toneless syllable
Tone 1 (55)	Starts high, then falls.
Tone 2 (35)	Starts high, then falls (but not as low as after 55)
Tone 3 (214)	Starts fairly low, then rises.
Tone 4 (51)	Starts fairly low, and falls even lower.

However, Yip does not mention whether Shih's data came from real-life conversation or elicited utterances. It is significant to note the difference. Given that the data are chunks of words, or two-word or three-word expressions, the results might have some limitations.

In this study, all 62 *ma*-particle questions are grouped into four major types in terms of the preceding toned syllable: Tone1, Tone2, Tone3 and Tone4 respectively. That is to say, the toneless syllable is adjacent to four different citation tones in the data.

#### 5.1.3.1. Tone1 as the lexical tone of the preceding toned syllable

The first type is that Tone1 (55, high level) is the lexical tone of the preceding toned syllable adjacent to *ma*. The results are:

- 3 out of 5 instances display rise-fall, which are in line with Shih's (1987) description of the toneless syllable after Tone 1.

- 2 out of 5 instances display rising pitch movement, which is not consistent with the previous work of the tonal combination of Tone1 adjacent to Tone0.

Consider one instance from the map-task-type conversation.

Example 7: 端了吗 (Turn 19 in Group 3)

(7) Tone1 + Tone0

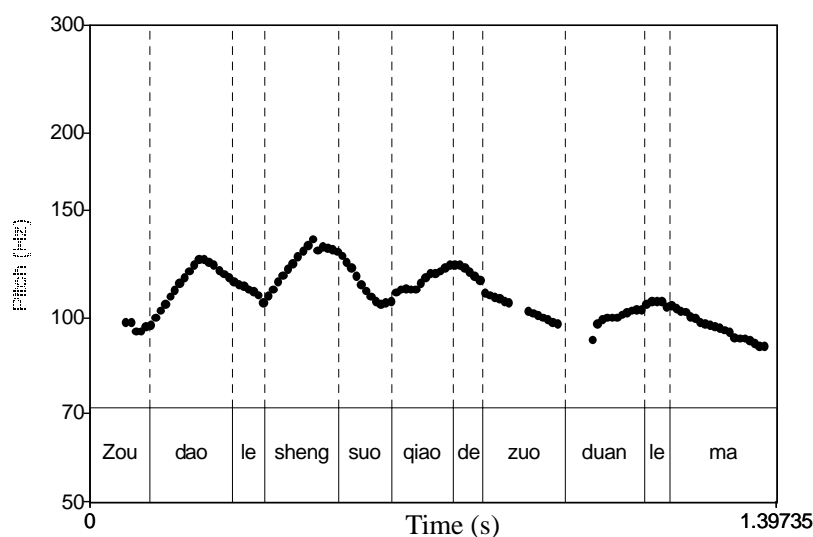
rise      fall

走 到 了 “绳索桥” 的 左端 了 吗?

zou dao le shengsuoqiao de zuoduan le ma

walk reach ASP rope:bridge PT left ASP QP

“Have you reached the left of the ‘Rope Bridge’?”



Graph 5. 7 Non-final rise-fall in *duan le ma*

The frequency analysis in Graph 5.7 shows that the pitch rises over the syllable of *duan* and falls on the toneless syllables of *le* and *ma*. It is important to note that the realization of the underlying toned syllable of Tone1 in this context becomes rising instead of a high level. In addition, the aspect marker is situated at the transitional place and the question particle seems more prominent in duration.

On the other hand, there are two instances where the pitch movement of the toneless syllable rises rather than falls, contrary to the past research on the effect of preceding lexical tone on the adjacent toneless syllable.

Consider the following instance.

Example 8: 目光吗 (Turn 97 in Group 3)

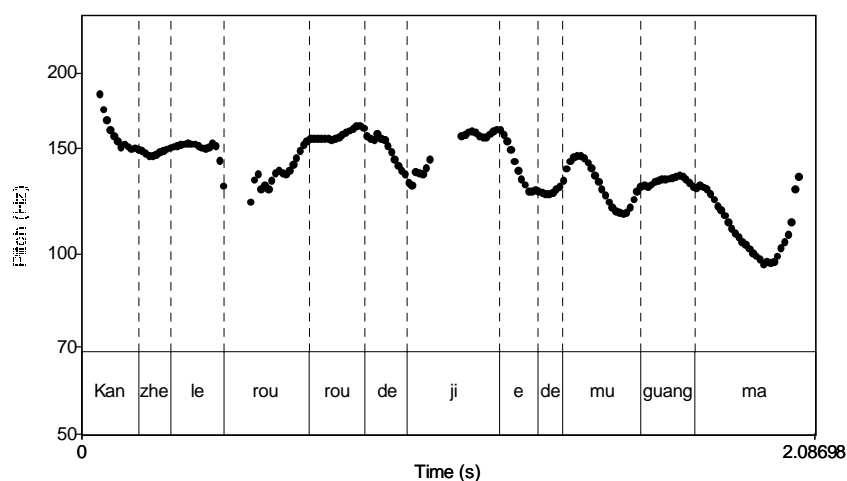
(8) Tone1 + Tone0

rise      rise

看   着   了   “柔柔的饥饿的**目光**”   吗?

kan   zhao   le   rouroude ji'ede muguang   ma

see   ASP   ASP   soft:famishings:stare   QP



Graph 5. 8 Turn-final low-rise in *muguang ma*

The frequency analysis in Graph 5.8 shows that the pitch rises over the syllable of *guang*, and rises again from the lowest pitch point in the overall utterance over the syllable of *ma*. A high rise can be seen as a typical intonation pattern for English questions. However, a low rise is one type of pitch contour of the yes/no question ending with *ma* in Mandarin Chinese.

It is worthy of note that Tone1 does not display as a high level as its underlying tone, but it rises all the way over the syllable. This instance is not consistent with Shih's (1987) reports and suggests that it is also possible for the toneless syllable after Tone1 to have a terminal rise.

#### 5.1.3.2. Tone2 as the lexical tone of the preceding toned syllable

The second type is that Tone2 (35, rise) is the lexical tone of the preceding toned syllable adjacent to *ma*. According to Shih's (1987) reports, the toneless syllable *ma* falls after Tone2, which has a mid-rising citation tone.

The results of the pitch movement of the last syllable of *ma* in the tonal combination of Tone2 and Tone0 are:

- 12 out of the 30 instances have a terminal fall, which is consistent with Shih's observation;
- 14 out of the 30 instances have a terminal rise, which is not in line with previous findings;
- 4 out of the 30 instances have a terminal level, which presents a relatively new finding in research on intonation of yes/no questions in Mandarin conversation.

The first piece of evidence indicates that Shih's description of the falling pitch of the toneless syllable after Tone2 can be found in the data. This pitch pattern has the second highest percentage in the total of the 30 instances.

Consider one instance from the data.

Example 9: 明白了吗 (Turn 63 in Group 3)

(9) Tone2 + Tone0

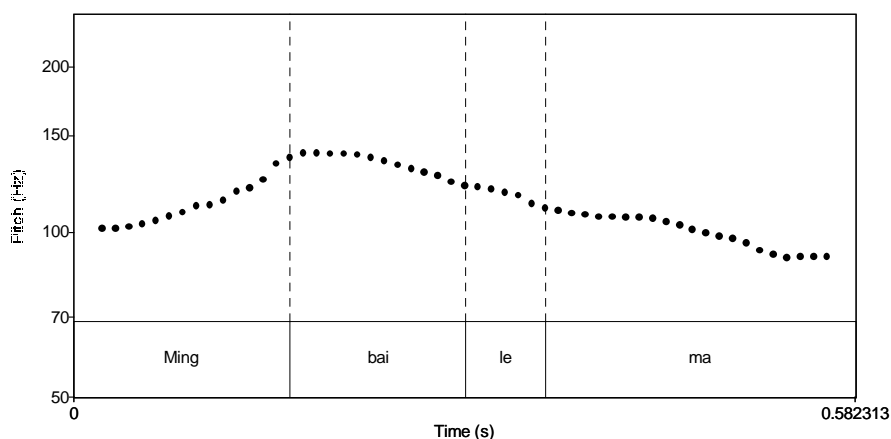
rise      fall

明白      了      吗?

mingbai      le      ma

understand      ASP      QP

“Do you see (what I mean)?”



Graph 5.9 Turn-final fall in *mingbai le ma*

The frequency analysis in Graph 5.9 displays that the pitch rises over the syllable of *ming* gradually and reaches the highest point, and then the pitch falls down over the three toneless syllables of *bai*, *le* and *ma*. It is interesting to note that *ma* has the longest duration among the four syllables in the overall question.

On the other hand, the toneless syllable also displays the rising and level intonation in the map-task-type conversation. Consider one instance of the rising intonation.

Example 10: “(大)观景台”吗 (Turn 31 in Group 8)

(10) Tone2 + Tone0

fall rise

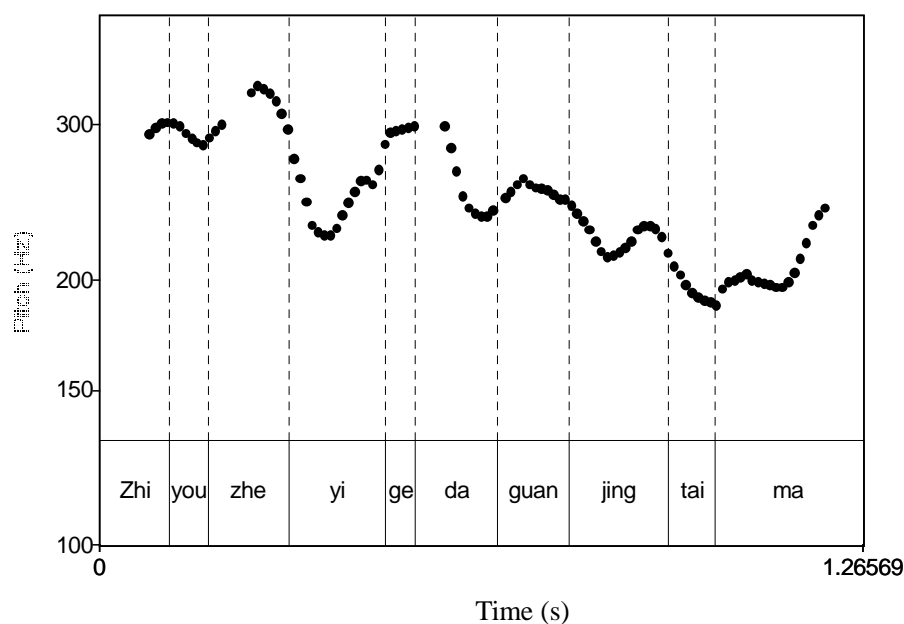
只 有 这 一 个 “大观景台” 吗?

zhi you zhe yi ge da guanjingtai ma

only have this one CLS great:viewpoint QP

“Do you have only one ‘Great Viewpoint’ (on your map)?”





Graph 5.10 Non-final fall-rise in *guangjingtai ma*

The frequency analysis in Graph 5.10 demonstrates that the pitch falls over the syllable of *tai*, and then the pitch rises till the end of the yes/no question. The preceding toned syllable of *tai* does not display a mid-rise. Instead, the pitch shows a fall to the lowest point in the overall question. This instance does not follow the pattern described by Shih (1987). It suggests that the pitch movement of the preceding lexical tone is not the only correlate contributing to the realization of the pitch pattern of the final toneless syllable of *ma*.

It is also possible for the toneless syllable to have a terminal level after Tone2.

The following is one such instance.

Example 11: (完)成了吗 (Turn 63 in Group 2)

(11) Tone2 + Tone0

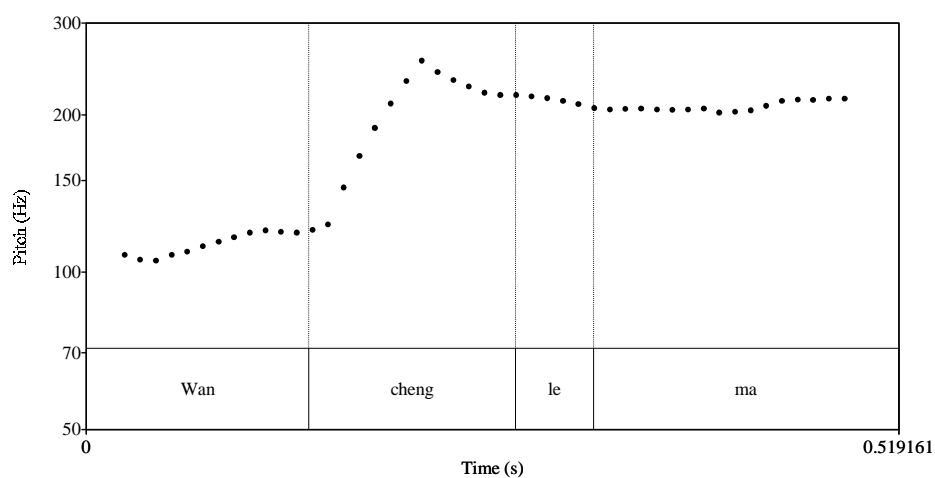
fall level

完成 了 吗?

wancheng le ma?

finish ASP QP

“(Have you) done (it)?”



Graph 5. 11 Turn-final fall-level in *cheng le ma*

The frequency analysis in Graph 5.11 shows that the pitch over the syllable of *cheng* falls slightly and then tends to retain almost the same pitch value till the end of the question.

The syllable of *cheng* does not display its underlying tone as a mid-rise, but it falls from the highest pitch point. In this case, the preceding syllable again does not seem to play a significant part in the realization of the pitch movement of the final syllable of *ma*. In addition, it is important to note that there appears to be a pitch tracking error in the pitch plot, as the pitch suddenly jumps from 120 Hertz to 270 Hertz.

### 5.1.3.3. Tone3 as the lexical tone of the preceding toned syllable

The third type is Tone3 (214, fall-rise) as the lexical tone of the preceding toned

syllable adjacent to *ma*. Based on Shih's reports, the pitch movement of the toneless syllable after Tone3 has a terminal rise. The results of the pitch movement of the final syllable of *ma* in the tonal combination of Tone3 and Tone0 are:

- 9 out of the 16 instances have a terminal rise, predicted by Shih's findings;
- 2 out of the 16 instances have a terminal fall, inconsistent with prior work;
- 5 out of the 16 instances have a terminal level, which again represents a new finding.

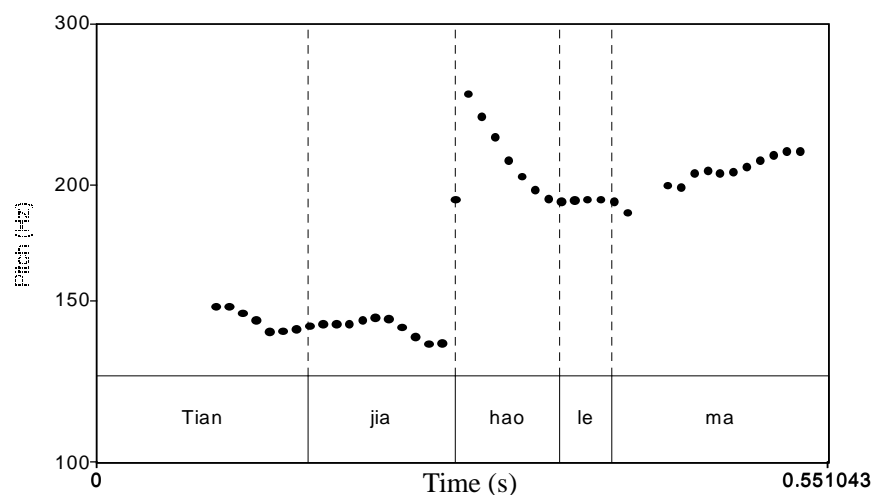
The first piece of evidence shows that the pitch movement of the toneless syllable is strongly affected by the preceding toned syllable of Tone3. The rising pitch of *ma* is in line with Shih's findings. More than half of the instances in the data display the terminal rising intonation.

Example 12: 好了吗 (Turn 5 in Group 8)

(12) Tone3 + Tone0

	fall	rise	
添加	好 了 吗?		
tianjia	hao	le	ma
add	well	ASP	QP

“Have you added (the landmark I have described on your map)?”



Graph 5.12 Turn-final fall-rise in *hao le ma*

The frequency analysis in Graph 5.12 shows that the pitch falls from the highest pitch point in the overall question over the syllable of *hao* (214, fall-rise). The underlying tone of *hao* is a fall-rise, but it has not been fully realized in this instance, showing the first part of the pitch movement of falling, with second rising part unrealized. Subsequently, the pitch remains level on the syllable of *le*, an aspect marker. Finally, the pitch starts to rise gradually over the last syllable of *ma*, a question particle.

On the other hand, the level intonation patterns can also be found in the data.

Consider one instance of the level intonation.

Example 13: “起点”了吗 (Turn 1 in Group 5)

(13) Tone3 + Tone0 + Tone0

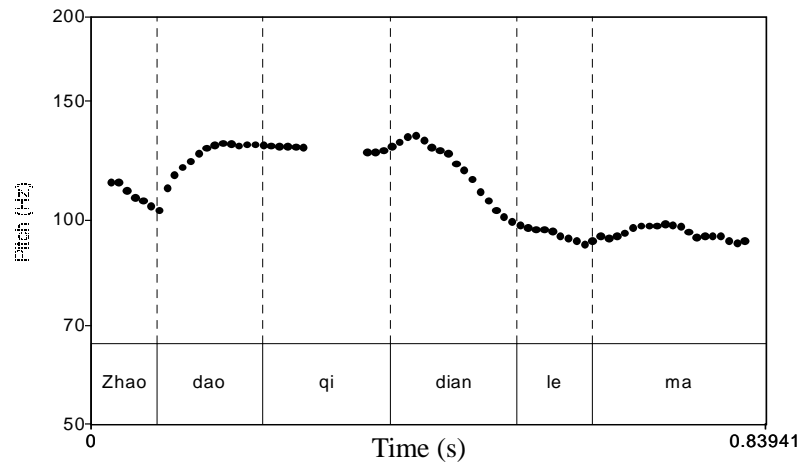
fall      level    level

找到      “起点”      了      吗?

zhaodao      qidian      le      ma

find starting:point ASP QP

“Have you found the ‘Starting Point’?”



Graph 5. 13 Turn-final level in *dian le ma*

The frequency analysis in Graph 5.13 shows that the pitch falls from the highest pitch point of the overall utterance and falls over the syllables of *dian* and *le*. In this case, the tonal shape of the syllable of *dian* (214, fall-rise) has not been fully realized. The falling movement is shown in the Praat picture, but the rising movement is not realized in the connected speech. The pitch movement over the syllable of *ma* is a slight fall from 98 Hertz to 92 Hertz, but I group it to a level because the gap is 6 Hertz, less than 10 Hertz.

Another instance shows that the toneless syllable of *ma* may display a terminal level in the midst of a turn.

Example 14: “起点”了吗 (Turn 1 in Group 8)

(14) Tone3 + Tone0 + Tone0

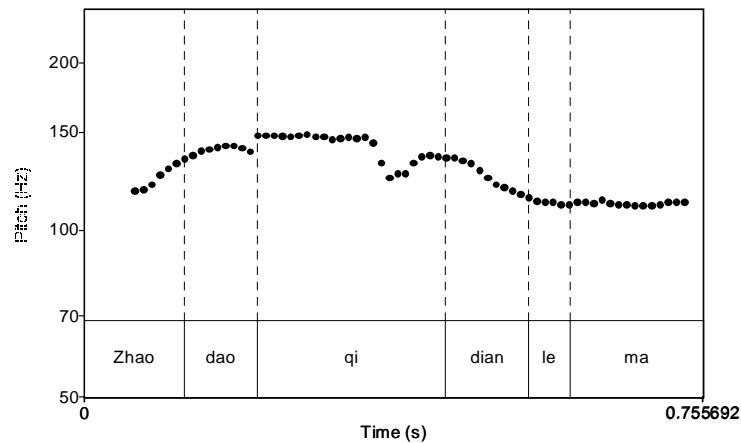
fall level level

找到 “起点” 了 吗?

zhaodao qidian le ma

find starting:point ASP QP

“Have you found the ‘Starting Point’?”



Graph 5. 14 Non-final level in *dian le ma*

It can be seen from the frequency analysis in Graph 5.14 that the pitch falls over the syllable of *dian* (214, fall-rise). Once again, the falling movement is realized and the rising movement is not. Over the last two toneless syllables of *le* and *ma*, the pitch remains level till the end of the question.

#### 5.1.3.4. Tone4 as the lexical tone of the preceding toned syllable

The fourth type is that Tone4 (51, fall) is the lexical tone of the preceding toned syllable adjacent to *ma*. Shih (1987) reports that the pitch movement of the toneless syllable after Tone 4 is a fall.

The results of the pitch movement of the final syllable of *ma* in the tonal combination of Tone4 and Tone0 are:

- 6 out of the 11 instances have a terminal fall, predicted by Shih's findings;
- 3 out of the 11 instances have a terminal rise, inconsistent with previous work;
- 2 out of the 11 instances have a terminal level, which is again a new finding of this study.

The first piece of evidence shows that more than half of the instances are in line with Shih's description of the pitch contour of the toneless syllable after Tone4. Consider one instance from the data.

Example 15: 到了吗 (Turn 14 in Group 3)

(15) Tone4 + Tone0

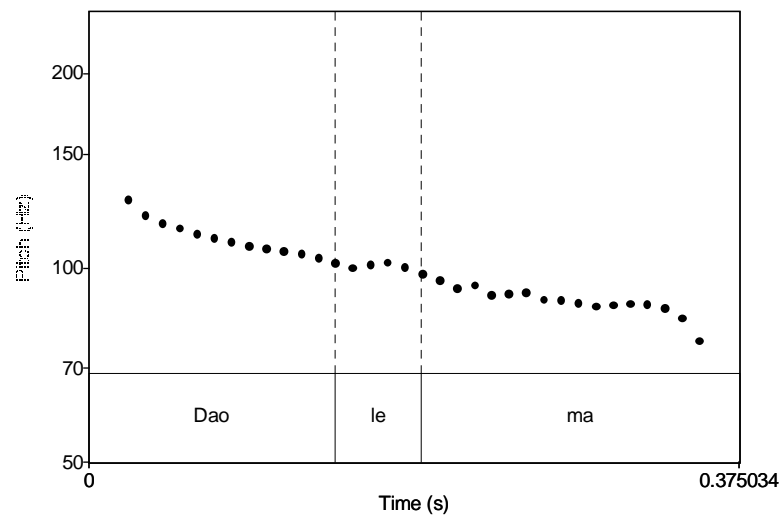
fall      fall

到      了      吗?

dao    le    ma

reach ASP QP

“Have (you) reached (the point where I have described)?”



Graph 5. 15 Turn-final fall in *dao le ma*

It can be seen from the frequency analysis in Graph 5.15 that the pitch falls from the highest point in the overall question over the syllable of *dao* (51, fall) and continues with its falling tendency over the syllables of *le* and *ma* till the end of the question.

On the other hand, my data show that it is possible for the toneless syllable of *ma* to display a terminal rise after Tone4. Consider one such instance.

Example 16: (看到了吗 (Turn 23 in Group 2)

(16) Tone4 + Tone0

fall      rise

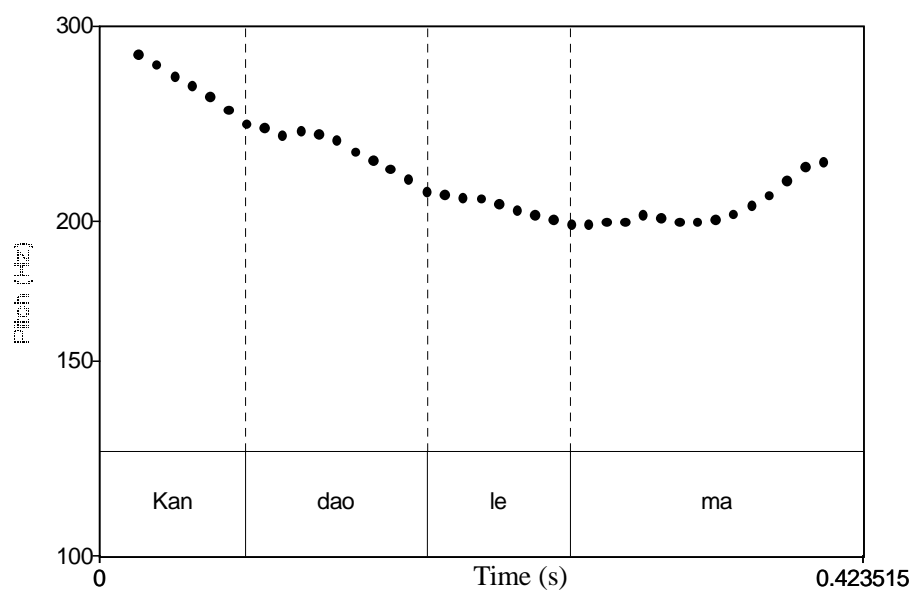
看到      了      吗?

kandao      le      ma

see      ASP      QP

“Have you seen (the same landmark I have described on your map)?”





Graph 5.16 Turn-final fall-rise in *dao le ma*

The frequency analysis in Graph 5.16 shows that the highest pitch in the overall question falls over the toned syllables of *kan* (51, fall) and *dao* (51, fall), and then the pitch continues with the falling tendency over the first toneless syllable of *le*, an aspect marker. However, the pitch rises on the last toneless syllable of *ma* till the end of the question, contrary to previous research claims.

The evidence from my data also suggests that the toneless syllable of *ma* can have a terminal level even after Tone4. Consider the following instance.

Example 17: 看到了吗 (Turn 3 in Group 8)

(17) Tone4 + Tone0

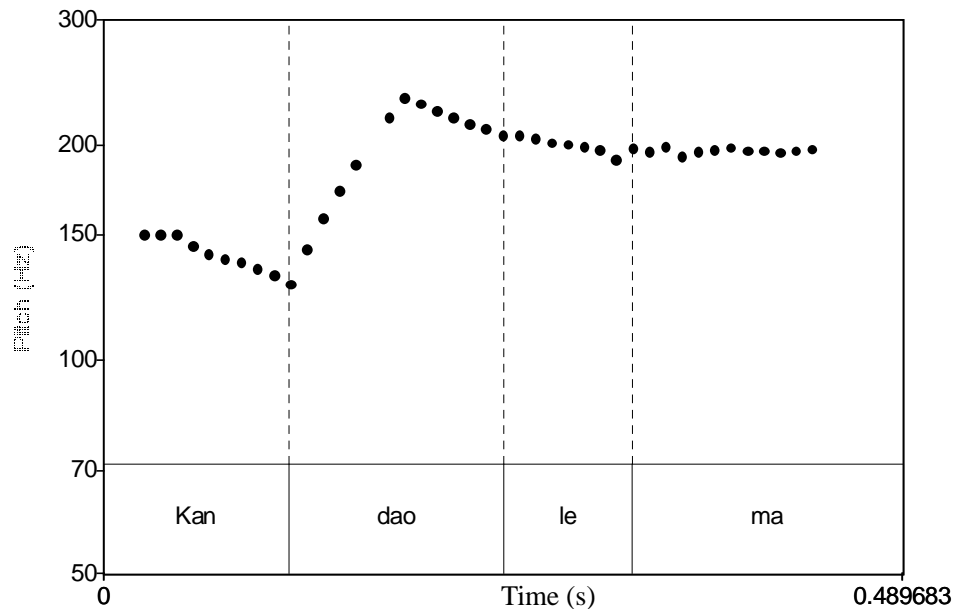
fall level

看到 了 吗?

kandao le ma

see ASP QP

“Have you seen (the same landmark I have described on your map)?”



Graph 5.17 Turn-final fall-level in *dao le ma*

This is the same question as in (16), produced by the same speaker in a different turn in the same conversation; however, it displays a different pitch track. The pitch falls over the syllable of *kan* (51, fall). It is important to note that there seems to be a pitch tracking error in the pitch plot, as the pitch suddenly jumps from 120 Hertz to 240 Hertz. The frequency analysis in Graph 5.17 shows that the pitch falls over the syllable of *dao* (51, fall), after which the pitch continues with a falling tendency over the first toneless syllable *le*, an aspect marker. Finally, the pitch remains level till the end of the question. The comparison between (16) and (17) implies that there might be some distinctions on the relevance of conversational activities, which cause the difference in pitch contours.

To summarize, the results demonstrate that about half of the instances of the toneless syllable after the toned syllable follow the pitch patterns described in Shih's (1987) reports, illustrated in Table 5.1. However, almost half of the instances in my data do not follow the patterns prescribed by previous research. For instance, the toneless syllable of *ma* has two pitch movements after Tone1: rising and falling. After Tone2, Tone3, Tone4, it is possible for the toneless syllable of *ma* to display a rise, a fall, and a level. It seems that the preceding toned syllable does not play a deterministic role in the realization of the pitch movement of the final syllable *ma* in the particle questions.

Prior research suggests that a terminal rise is a typical interrogative intonation in Mandarin Chinese (Shen 1994), and a terminal fall is found in yes/no question in Beijing dialect, one variety of Chinese (Shen 1990). However, this study finds an entirely new intonational phenomenon that the toneless syllable of *ma* in yes/no questions may have a terminal level in Mandarin Chinese conversation.

In what follows, I am going to provide a summary of the underlying lexical tone of the preceding toned syllable and the surface final intonation of *ma*-particle question and the sequential placement and the pragmatic function of each *ma*-particle question.

Table 5. 2 Summary of *ma*-particle questions

Example Number	Toned syllable and <i>ma</i>	Tonal combination	Preceding toned syllable	Final intonation	Sequential placement	Shih's report	Pragmatic function
5.1	(Wan) <i>cheng le ma</i>	Tone2+Tone 0	35 Rise	Rise	Non-final	FALL	To seek confirmation
5.2	(Wan) <i>bi ma</i>	Tone4+Tone 0	51 Fall	Fall	Final	Fall	To seek confirmation
* <sup>1</sup> 5.3	(Wan) <i>cheng le ma</i>	Tone2+Tone 0	<b>35 Rise</b>	<b>Level</b>	Final	FALL	To seek confirmation
*5.4	(Hai) <i>wan ma</i>	Tone1+Tone 0	<b>55 Level</b>	<b>Fall</b>	Final	Fall	To seek information
5.5	<i>Mingbai le ma</i>	Tone2+Tone 0	35 Rise	Rise	Final	FALL	To check understanding
5.6	<i>qiang le ma</i>	Tone2+Tone 0	35 Rise	Rise	Non-final	FALL	To seek information
*5.7	(Zuo) <i>duan le ma</i>	Tone1+Tone 0	<b>55 Level</b>	<b>Fall</b>	Non-final	fall	To seek information
*5.8	(mu) <i>guang ma</i>	Tone1+Tone 0	<b>55 Level</b>	<b>Rise</b>	Final	FALL	To seek information
*5.9	<i>Mingbai le ma</i>	Tone2+Tone 0	<b>35 Rise</b>	<b>Fall</b>	Final	fall	To check understanding
5.10	(jing) <i>tai ma</i>	Tone2+Tone 0	35 Rise	Rise	Non-final	rise	To seek information
*5.11	(Wan) <i>cheng le ma</i>	Tone2+Tone 0	<b>35 Rise</b>	<b>Level</b>	Final	FALL	To seek confirmation
*5.12	<i>hao le ma</i>	Tone3+Tone 0	<b>214 Fall-rise</b>	<b>Rise</b>	Final	rise	To seek confirmation
*5.13	(Qi) <i>dian le ma</i>	Tone3+Tone 0	<b>214 Fall-rise</b>	<b>Level</b>	Final	RISE	To seek information
*5.14	(Qi) <i>dian le ma</i>	Tone3+Tone 0	<b>214 Fall-rise</b>	<b>Level</b>	Non-final	RISE	To seek information
5.15	<i>Dao le ma</i>	Tone4+Tone 0	51 Fall	Fall	Final	fall	To seek confirmation
*5.16	(Kan) <i>dao le ma</i>	Tone4+Tone 0	<b>51 Fall</b>	<b>Rise</b>	Final	FALL	To seek confirmation
*5.17	(Kan) <i>dao le ma</i>	Tone4+Tone 0	<b>51 Fall</b>	<b>Level</b>	Final	FALL	To seek confirmation

From Table 5.2, I have made two observations on the basis of 17 representative *ma*-particle questions in terms of prior research on the preceding toned syllable and the neutral tone as the last syllable of an utterance. First, the interesting question is to what extent the preceding toned syllable contributes to the final pitch of *ma*-particle questions. My observation is that the preceding toned syllable determines the final pitch of *ma*-particle questions in 29 per cent (5 out of 17) of the 17 instances. However, the preceding toned syllable does not have any impact on the final pitch of *ma*-particle questions in 71 per cent (12 out of 17) of the 17 instances. There are three possible causes for this phenomenon. First, interrogative intonation might play a role in the final pitch of the *ma*-particle question. Second, pragmatic functions such as to seek for confirmation or to check understanding might affect the final pitch to some extent. Finally, the sequential placement of the question such as turn-internal and turn-final questions might have an influence on the final pitch as well.

In addition, based on the Shih's (1987) report on the final pitch of toneless syllable in adjacent to the toned syllable, the results of the 17 *ma*-particle questions show that 41 per cent (7 out of 17) of instances are consistent with Shih's report and that 59 per cent (10 out of 17) of those are not consistent with Shih's report.

The next subsection contains the investigation into the prosodic characteristics of the A-not-A interrogative. The pitch movement is more complex because the 'A-not-A' question can end with any of the four citation tones (Tone1, Tone2, Tone3 and Tone4), in addition to the neutral tone (Tone0).

## 5.2. Prosodic characteristics of the ‘A-not-A’ interrogative

In Mandarin Chinese, there is a special type of yes/no question called the “A-not-A” question in addition to the *ma*-particle question. It is formed with the main verb followed by negation *bu* or *mei* and the reduplicated verb. The Praat program is used to facilitate and enhance the analysis of the pitch of the yes/no question with ‘A-not-A’ frame.

There are 75 yes/no questions with the ‘A-not-A’ frame in the eight map-task-type conversations in my data. However, there are two variations of ‘A-not-A’ frame. One type is the construction like *是不是 shi bu shi* ‘COP + NEG + COP’ and *有没有 you mei you* ‘have + NEG + have’. The other type is *是否 shifou* ‘COP + NEG’. These two variations bear the same interrogative information, but they may have slightly different pragmatic interpretations in real-life conversation. However, since this study focuses on the role of prosody of yes/no interrogatives in Mandarin conversation, pragmatic functions are not studied in details, which might be an interesting topic of my future research.

### 5.2.1. Pitch movement of the final prosodic unit of the ‘A-not-A’ interrogative

Inspection of 75 ‘A-not-A’ questions suggests that they end in eight types of pitch contours: fall, fall-level, rise-fall, fall-rise, rise-level, level-fall, rise, and level. The pitch patterns seem more complex than the yes/no question ending with *ma*. The prosodic unit discussed is made up of the accented syllable and the following unstressed syllable(s). Provided that the original lexical tone of the accented syllable displays the rising, falling

or level intonation and the unstressed syllable also has one of the three possibilities: rise, fall or level, this makes nine possible complex pitch movements of the prosodic unit at the end of the question. The results demonstrate that there are seven complex pitch patterns except for level-rise and level-level, which have not been found in my data. It is worthy of note that the same pitch patterns exist in the turn-final declarative ending with toned syllable in my data (see section 5.3.).

In the subsequent section, all the seven different complex pitch contours of the final prosodic unit of ‘A-not-A’ questions are discussed with exemplification from the data.

#### 5.2.1.1. Fall-rise

Based on the previous work on the intonation of the yes/no questions, the typical interrogative intonation described by Shen (1994) as fall-rise accounts for 9 per cent and ranks the fourth in the seven different complex pitch contours of the last prosodic unit in the ‘A-not-A’ question. Consider one instance from the data.

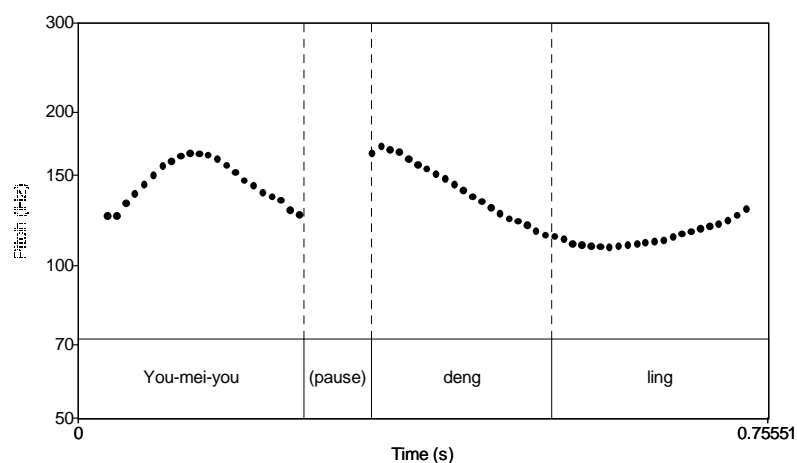
Example 18: 瞪羚 (Turn 99 in Group 3)

(18) 有 没 有 “瞪羚” ?

you mei you dengling

have NEG have gazelle

“Is there (the landmark labeled) the ‘Gazelle’?”



Graph 5. 18 Turn-final fall-rise in *dengling*

The frequency analysis in Graph 5.18 illustrates that the pitch falls over the accented syllable of *deng* (51, fall), and rises over the unstressed syllable of *ling* (35, rise). In this instance, two syllables in the prosodic unit display their original lexical tonal shape respectively: fall-rise. The underlying tone displays quite a strong influence on the final pitch movement of the ‘A-not-A’ question in this context, as predicted by previous research. On the other hand, falling intonation ranks first in the seven types of pitch movements of the ‘A-not-A’ questions under discussion.

### 5.2.1.2. Fall

Previous research on the intonation of Mandarin Chinese suggests that the fall is a typical pitch movement of declaratives (Shen 1994). However, falling intonation has been found as the most important pitch movement for yes/no questions with ‘A-not-A’ frame. In a similar vein, Shen (1990) studies the intonation of the Beijing dialect and finds that falling pitch has been found for the yes/no question, and it is also possible for the yes/no question to have a fall in Mandarin conversation.



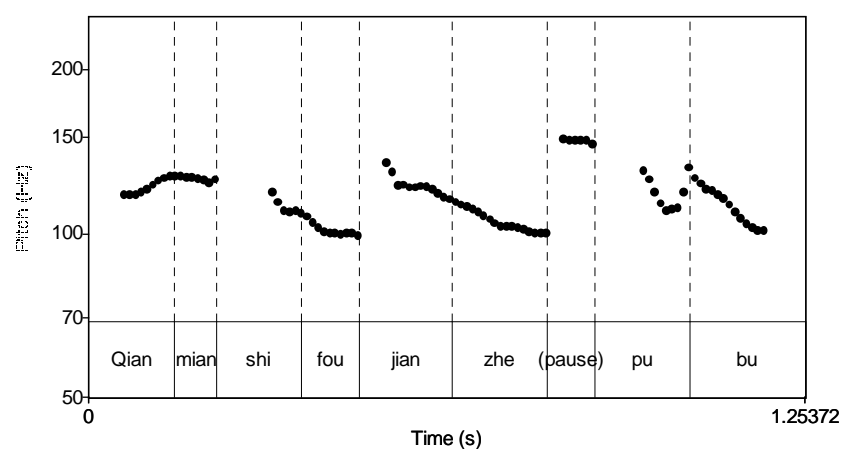
Example 19: 瀑布 (turn 29 in Group 3)

(19) 前面 是 否 见 着 “瀑布” ?

qianmian shi fou jian zhe pubu

front COP NEG see ASP waterfalls

“Do you see (the landmark labeled) the ‘Waterfalls’ in the front?”



Graph 5.19 Turn-final fall in *pubu*

The frequency analysis in Graph 5.19 illustrates that the pitch falls over the syllables of *pu* (51, fall) and *bu* (51, fall). In this context, the underlying tone of the accented syllable as well as the subsequent unstressed syllable has a significant impact on the final pitch movement of the yes/no question with ‘A-not-A’ frame, as predicted by prior research.

### 5.2.1.3. Fall-level

A fall-level has the second highest percentage in the seven types of complex pitch movements in the data, accounting for 17 per cent.

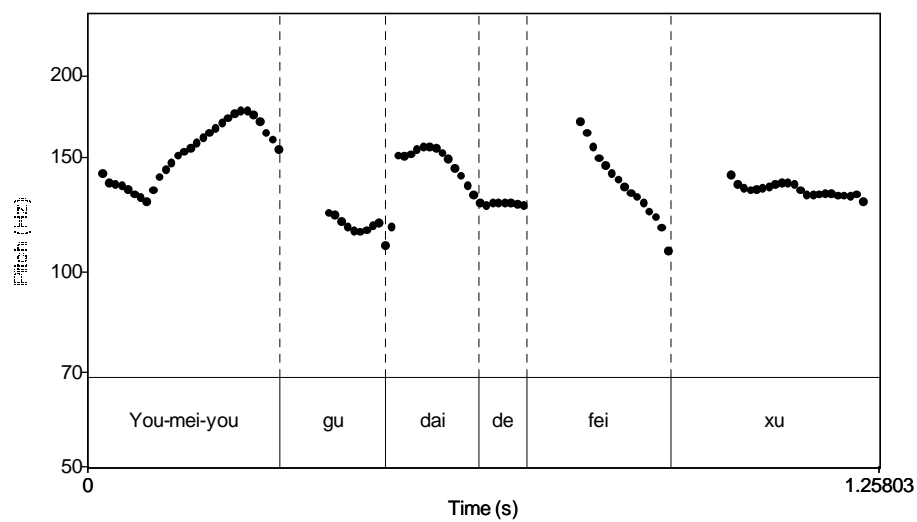
Example 20: 废墟 (Turn 81 in Group 3)

(20) 有 没 有 “古代的废墟” ?

you mei you gudaide feixu

have NEG have ancient:ruins

“Do (you) have (the landmark labeled) the ‘Ancient Ruins’?”



Graph 5. 20 Turn-final fall-level in *feixu*

It can be seen from the frequency analysis in Graph 5.20 that the pitch falls on the accented syllable of *fei* (51, fall), and remains level on the unstressed syllable of *xu* (55, level). In this instance, the tonal shape of the original lexical tone is fully realized in the utterance and remains unaffected. As a result, the underlying tone plays a significant role in the final pitch movement of yes/no questions, as predicted by previous research.

Another important pitch pattern is a rise-fall.

#### 5.2.1.4. Rise-fall

Provided that the accented syllable has a rise and the unstressed syllable displays a fall, it is possible for the ‘A-not-A’ yes/no question to have a rise-fall.

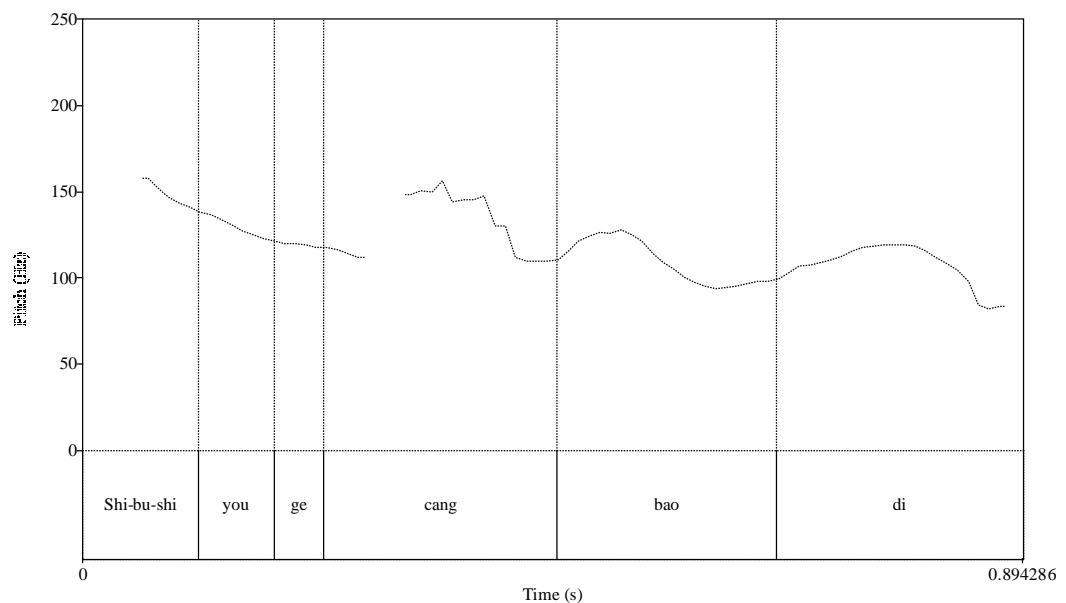
Example 21: 藏宝地 (Turn 26 in Group 7)

(21) 是 不 是 有 个 “藏宝地” ？

shi bu shi you ge cangbaodi

COP NEG COP have CLS treasure:buries:here

“Do (you) have (the landmark labeled) the ‘Treasure Buries Here’?”



Graph 5. 21 Turn-final rise-fall in *cangbaodi*

The frequency analysis in Graph 5.21 illustrates that the pitch rises and falls over the syllable of *bao* (35, rise), and falls on the syllable of *di* (51, fall). In this instance, the pitch movement of the original lexical tone is not affected and remains the original tonal shape as a fall in the yes/no question, as predicted by prior research.

Three other types of pitch contours occur with a rather low percentage in the data: rise-level (5%), rise (4%), and level-fall (4%), as will be discussed below.

### 5.2.1.5. Rise-level

Consider one instance of the rise-level intonation from the data.

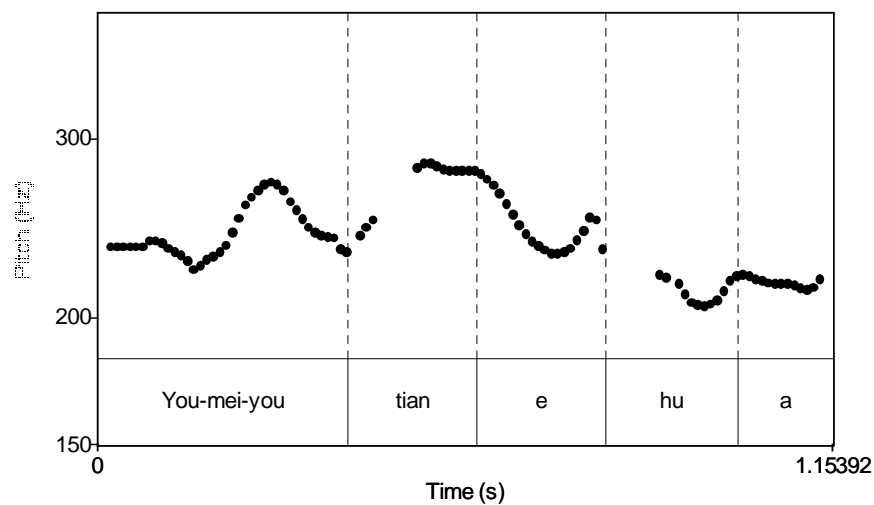
Example 22: “天鹅湖”啊 (Turn 41 in Group 6)

(22) 有 没 有 “天鹅湖” 啊?

you mei you tian'ehu a

have NEG have swan:lake QP

“Is there (the landmark labeled) the ‘Swan Lake’?”



Graph 5. 22 Turn-final rise-level in *tian'ehu a*

The frequency analysis in Graph 5.22 illustrates that the pitch reaches the lowest point and slightly rises on the syllable of *hu* (35, rise). In this instance, the pitch over *hu* does not display a mid-rise, but a low-rise. However, the pitch remains level and unchanged

on the toneless syllable of *a*, a question particle. This is not in line with Shih's (1987) reports, which suggest that the pitch movement of the toneless syllable after Tone2 (35 mid-rise) should display a fall.

### 5.2.1.6. Rise

Provided that the accented syllable and the subsequent unstressed syllable display rising intonation, it is potential for the yes/no question to end in a rise.

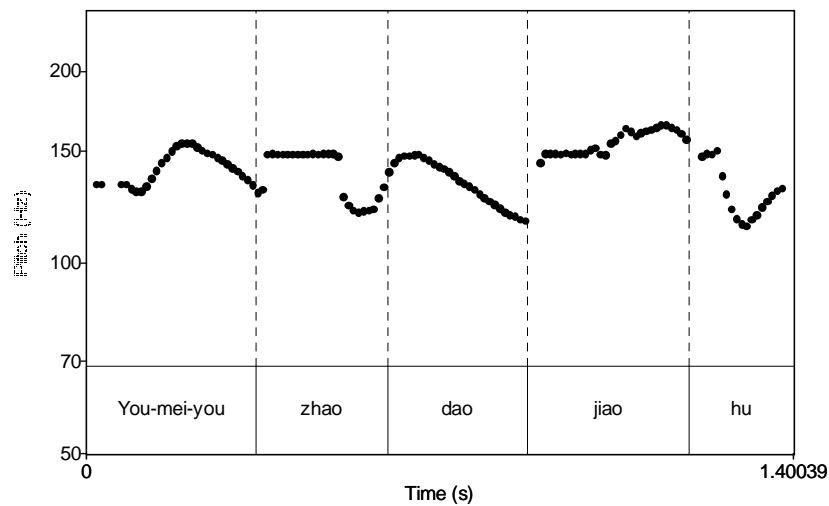
Example 23: “礁湖” (Turn 27 in Group 7)

(23) 有 没 有 找到 “礁湖” ?

you mei you zhaodao jiaohu

have NEG have find lagoon

“Have you found (the landmark labeled) the ‘Lagoon’?”



Graph 5. 23 Turn-final rise in *jiaohu*

The frequency analysis in Graph 5.23 illustrates that the pitch over the accented syllable

of *jiao* (55, level) rises, which is slightly different from the original tonal shape of the citation tone. However, the pitch has a low rise over the syllable of *hu* (35, rise), as predicted by previous research.

### 5.2.1.7. Level-fall

Provided that the accented syllable has a level and the unstressed syllable has a fall, it is potential for the yes/no question to display a level-fall. Consider one instance of the level-fall intonation from the data.

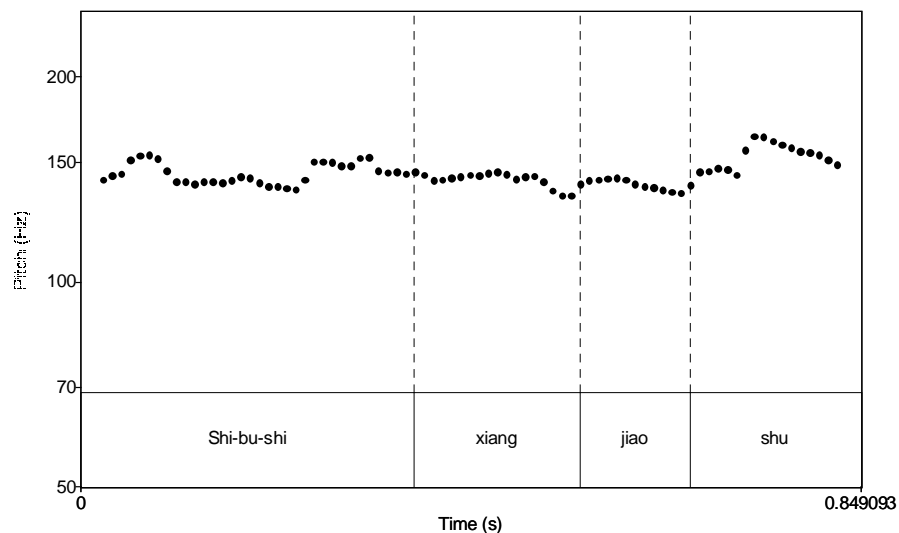
Example 24: “香蕉树” (Turn 15 in Group 3)

(24) 是 不 是 “香蕉树” ?

shi bu shi xiangjiaoshu

COP NEG COP banana:tree

“Is (it) the (the landmark labeled) ‘Banana Tree’?”



Graph 5. 24 Non-final level-fall in *xiangjiaoshu*

From the frequency analysis in Graph 5.24, it can be seen that the pitch over the syllable of *jiao* (55, level) remains rather stable, but the pitch reaches the highest point and falls over the syllable of *shu* (51, fall), as predicted by previous study.

In the above-discussed seven types of pitch movements, the analysis of my data shows that the underlying tone of the accented syllable and the subsequent unstressed syllable can be found unchanged and still keeps its original tonal shape in the yes/no question with ‘A-not-A’ frame. Similar pitch patterns exist in the final pitch of the turn-final declaratives ending with toned syllables (see Section 5.3.). These instances suggest that the underlying tone has a strong effect on the final pitch movement of ‘A-not-A’ questions. As a result, the underlying tone plays a deterministic role in the final pitch movement of the yes/no interrogative in the majority of cases. On the other hand, the underlying tone may not surface as the original tonal shape in some cases in the conversational data.

### **5.2.2. Pitch movement over the final syllable of the ‘A-not-A’ interrogative**

Provided that the accented syllable is not taken into account, there are only three types of pitch movements at the end of the yes/no question with ‘A-not-A’ frame in the data: rise, fall and level.

As we have pointed out earlier, Shen (1994) claims that the statement of Mandarin Chinese has falling intonation. In another study, Shen (1990) reports that the yes/no question may have falling intonation in Beijing dialect. Prior research does not suggest that a terminal fall is the pitch contour of the yes/no question in Mandarin Chinese. However, the evidence from the map-task-type conversation shows that the terminal

falling intonation is a very important type of final pitch movement of the yes/no question in Mandarin Chinese conversation.

In the case of the rising intonation, Cruttenden (1997:157) claims that the yes/no question usually has a terminal rise even in tone languages. However, an investigation of 75 ‘A-not-A’ questions in the map-task-type conversation suggests that only a small number of instances display a rise at the end of the yes/no interrogative.

Last but not least, ‘A-not-A’ questions may end with a terminal level. Previous work on interrogative intonation does not indicate that level pitch can be found to be the final pitch movement of the yes/no question in Mandarin Chinese. Nevertheless, the ‘A-not-A’ interrogative may have terminal level intonation in the direction-giving interaction in my data.

### **5.2.3. Effect of the underlying tone on the yes/no interrogative intonation**

In the discussion of the seven types of different complex pitch contours of the ‘A-not-A’ question, seven representative instances from the data showed that both the accented syllable and the subsequent unstressed syllable could retain their original underlying tonal shape at the end of the question in the map-task-type data. The underlying tone has been found to keep its original tonal shape in the majority of 75 ‘A-not-A’ questions in the data. This suggests that the lexical tone has a significant impact on the final pitch movement of the overall yes/no interrogative intonation.

On the other hand, there is good evidence that the underlying tone could be modified at the end of the yes/no interrogative in conversations. The following deviant instances indicate that the underlying tone might not be the only correlate that determines the final



pitch movement of the overall yes/no interrogative.

### 5.2.3.1. Tone1

The citation of Tone1 is high level (55), but in the following instance, the pitch of the syllable of Tone1 does not invariably display a terminal level in my data.

Example 25: 上方 (Turn 32 in Group 2)

(25) 是不是就是说“墙”在：嗯：“死木”

shi bu shi jiu shi shuo qiang zai en simu

COP NEG COP just COP say wall be:in eh, dead:tree

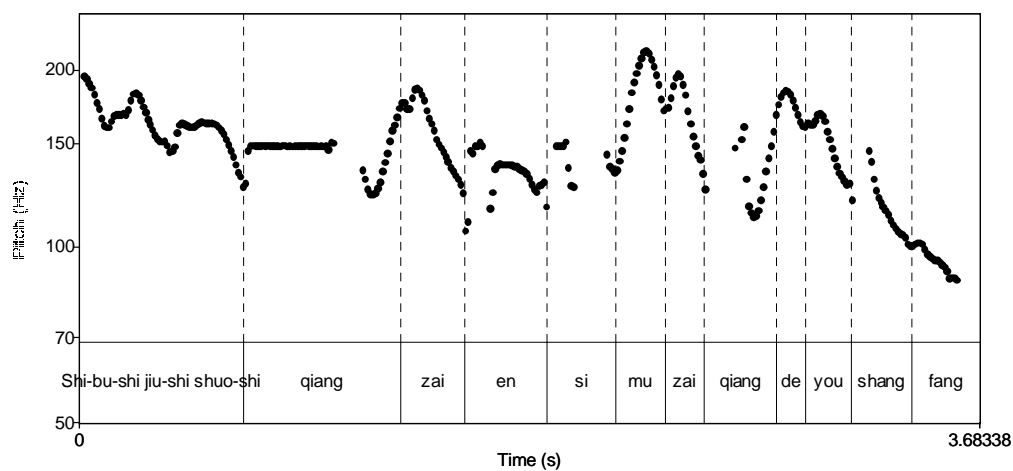
“Do (you) mean that (the landmark named) the ‘Wall’ is at: eh:: (the landmark

在“墙”的右 上方?

zai qiang de you shangfang

be:in wall PT right upper

labeled) the ‘Dead Tree’ is at the upper right of (the landmark labeled) the ‘Wall’?”



Graph 5. 25 Turn-final fall in *shangfang*

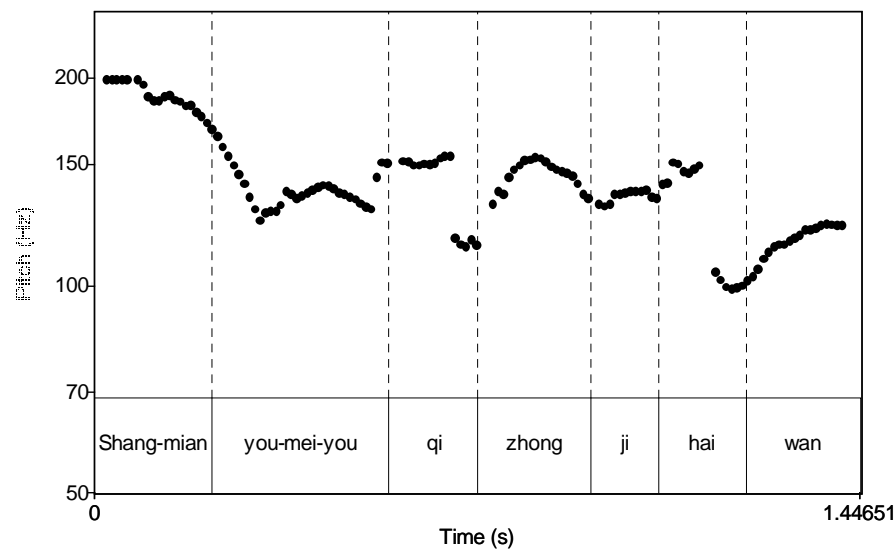
The frequency analysis in Graph 5.25 illustrates that the pitch over the last accented syllable of *shang* (51, fall) shows a falling pitch, retaining its original tonal shape as the underlying tone. However, the pitch over the unstressed syllable of *fang* (55, level) displays a low fall, arriving at the lowest pitch point in the overall yes/no interrogative. The pitch movement does not retain its original tonal shape as a level, but falls at the end of the ‘A-not-A’ interrogative.

Another example in the data shows that the pitch on the syllable of Tone1 may display a terminal rise in addition to a terminal fall in Example 25.

Example 26: 海湾 (Turn 7 in Group 7)

(26) 上面 有 没 有 “起重机海湾” ?  
 shangmian you mei you qizhongji haiwan  
 top have NEG have crane: bay

“Is there (the landmark labeled) the ‘Crane Bay’ on the top?”



Graph 5. 26 Turn-final fall-rise in *haiwan*

The frequency analysis in Graph 5.26 illustrates that the pitch over the syllable of *hai* (214, fall-rise) falls slightly, but the rising pitch is not realized in the connected speech. In addition, the pitch over the syllable of *wan* (55, level) does not display a level, but rises till the end of the question. This instance indicates that yes/no interrogative ending with Tone1 may have a terminal rise, aligned with Yuan, Shih and Kochanski 's (2002) report on Tone1 as the final syllable of the interrogative, i.e., a terminal rise.

### 5.2.3.2. Tone2

The citation tone of Tone2 is mid-rising (35), but the yes/no question ending with Tone2 might not display its original underlying tonal shape. The following is one instance from the data.

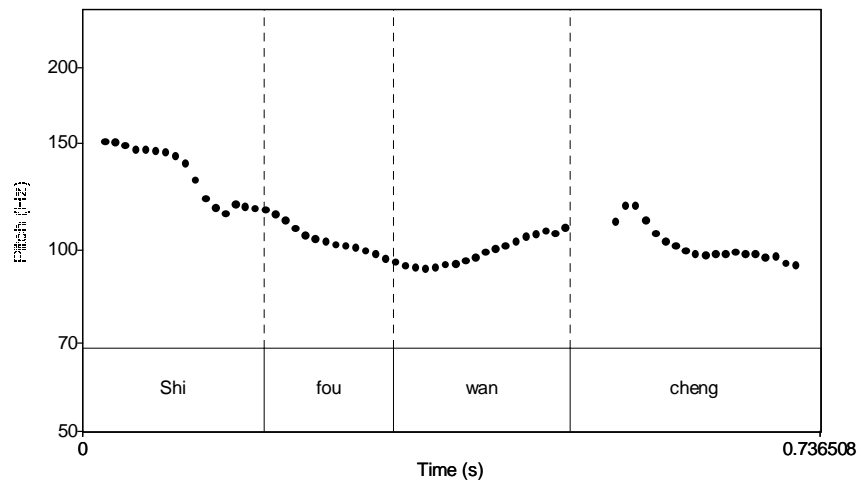
Example 27: 完成 (Turn 7 in Group 5)

(27) 是 否 完成?

shi fou wancheng

COP NEG finish

“Have you done (it)?”



Graph 5. 27 Turn-final rise-fall in *wancheng*

In the frequency analysis of Graph 5.27, the pitch over the syllable of *wan* (35, rise) shows a rise, consistent with the original tonal shape. However, the pitch over the syllable of *cheng* (35, rise) does not display a rise, but falls slightly till the end of the question. This is not in line with previous research, which claims that the underlying tone retains its original tonal shape at the end of the yes/no question. To illustrate, Yuan, Shih and Kochanski (2002) observe that Tone2 displays a rise as the final syllable of the interrogative.

This instance shows that the syllable of Tone2 may have a terminal rise as its original lexical tone like the stressed syllable of *wan*. Nevertheless, the yes/no

interrogative ending with Tone2 may have a terminal fall in my data.

### 5.2.3.3. Tone3

The citation tone of Tone3 is a fall-rise (214), but it may not be fully realized in the real-life conversation in some contexts. Sometimes, the pitch displays a fall instead of a fall-rise in connected speech. Consider the following instance in Example 28.

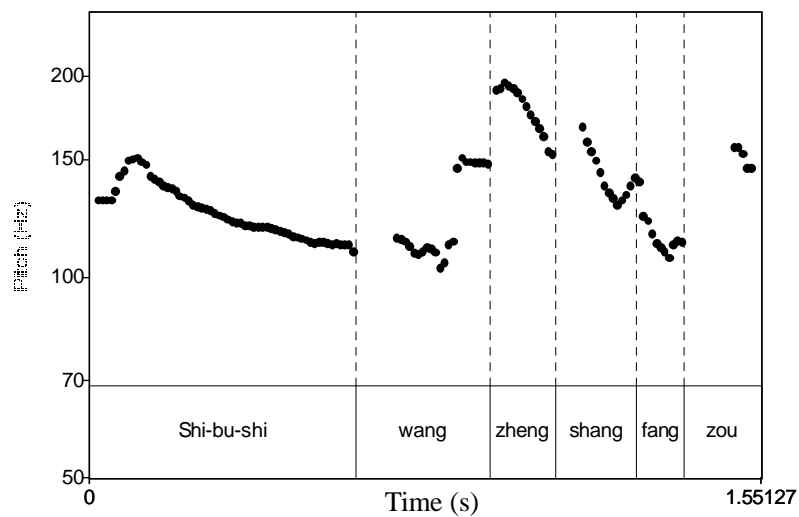
Example 28: 上方走 (Turn 38 in Group 3)

(28) 是 不 是 往 正 上方 走?

shi bu shi wang zheng shangfang zou

COP NEG COP toward just upwards walk

“Does you mean (I) walk just upwards?”



Graph 5.28 Turn-final fall in *shangfang zou*

The frequency analysis in Graph 5.28 illustrates that the pitch falls over the syllable of *fang* (55, high level), but it does not retain its original underlying tonal shape as a level.

At the end of the yes/no interrogative, Tone3 has enough time to realize its pitch movement as a fall-rise. However, the pitch falls slightly and stops. In other words, the rising part is not fully realized in this instance. This is not consistent with the report by Yuan, Shih and Kochanski (2002), who find that interrogatives display a rise when the final syllable is Tone3. In addition, note that there appears to be a pitch tracking error in the pitch plot, as the pitch suddenly jumps from 100 Hertz to 170 Hertz.

A similar case is Example 29.

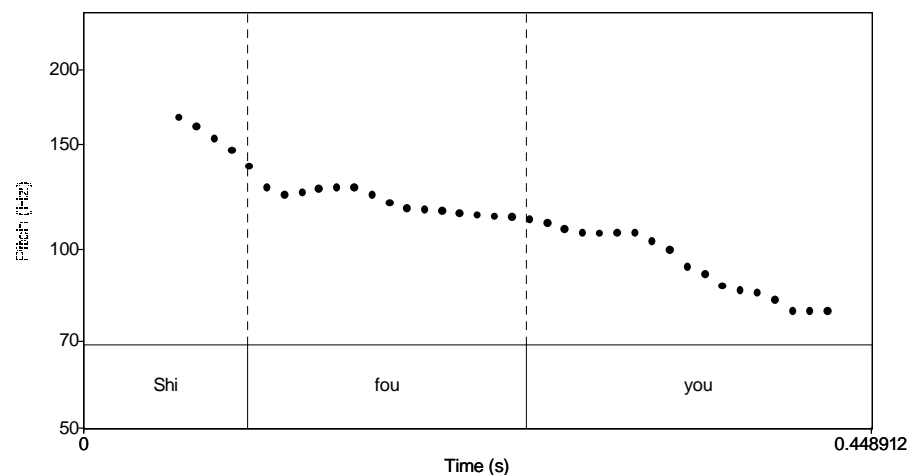
Example 29: 是否有 (Turn 53 in Group 5)

(29) 是 否 有 ?

shi fou you

COP NEG have

“Have you got (any landmark that I have described)? ”



Graph 5. 29 Turn-final fall in *shifou you*

It can be seen from the frequency analysis in Graph 5.29 that the pitch over the syllable of *you* (214, fall-rise) has not been fully realized. Actually, the end of the yes/no question would offer a chance to bring Tone3 into its full realization. However, the yes/no question has a terminal fall instead of a fall-rise. Again, this is not in accordance with the report by Yuan, Shih and Kochanski (2002).

#### 5.2.3.4. Tone4

The citation tone of Tone4 is a fall (51), and the pitch usually keeps its original tonal shape at the end of the ‘A-not-A’ question in the data. There is one special case in the map-task-type data where the pitch of Tone4 displays a level instead of a fall. Consider the following instance.

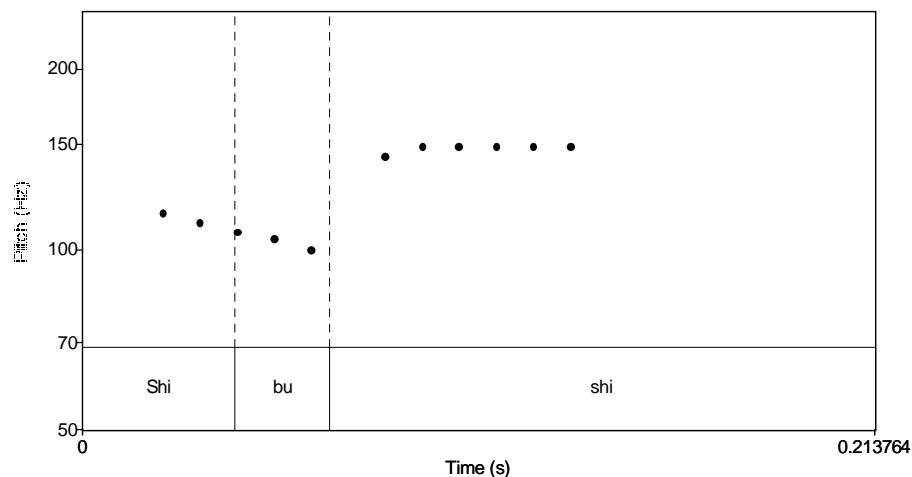
Example 30: 是不是 (Turn 50 in Group 7)

(30) 是 不 是

shi bu shi

COP NEG COP

“Is (what I have described) correct?”



Graph 5. 30 Turn-final fall-level in *shi bu shi*

It can be seen from the frequency analysis in Graph 5.30 that the pitch over the first syllable of *shi* (51, fall) has an obvious fall, and the falling tendency resumes over the unstressed syllable of *bu* (a toneless syllable here). However, the pitch over the final syllable of *shi* (51, fall) is not specified and displays a level.

All six deviant instances suggest that the underlying tone does not seem to play a significant role in the surface of their final pitch movement. Even though previous research on sentence intonation indicates that the citation/underlying tone tends to remain unchanged as its original tonal shape, the evidence in my data suggests that the underlying tone of the final syllable may display a different pitch movement from the original tonal shape of its underlying tone in some instances.

Next, I will present a summary of the underlying lexical tone of the preceding accented syllable and the final unstressed syllable and the final intonation of the A-not-A question as well as the sequential placement and the pragmatic function of A-not-A



questions.

Table 5. 3 Summary of A-not-A questions

Example Number	Accented and final syllables	Lexical tone of last syllable	Final intonation	Sequential placement	Pragmatic function
5.18	<i>dengling</i>	35 Rise	Rise	Final	To seek information
5.19	<i>pubu</i>	51 Fall	Fall	Final	To seek information
5.20	<i>feixu</i>	55 Level	Level	Final	To seek information
5.21	<i>cangbaodi</i>	51 Fall	Fall	Final	To seek information
5.22	<i>(tian'e)hu a</i>	Tone2+Tone0	Level	Final	To seek information
5.23	<i>jiaohu</i>	35 Rise	Rise	Final	To seek information
5.24	<i>xiangjiaoshu</i>	51 Fall	Fall	Non-final	To seek information
*5.25	<i>shangfang</i>	55 Level	Fall	Final	To seek information
*5.26	<i>haiwan</i>	55 Level	Rise	Final	To seek information
*5.27	<i>wancheng</i>	35 Rise	Fall	Final	To seek confirmation
*5.28	<i>Shangfang zou</i>	214 Fall-rise	Fall	Final	To seek confirmation
*5.29	<i>Shifou you</i>	214 Fall-rise	Fall	Final	To seek confirmation
*5.30	<i>Shi bu shi</i>	51 Fall	Level	Final	To seek confirmation

From Table 5.3, I list two types of relationship between the lexical tone of the last syllable and the final pitch. The first type is that the underlying lexical tone of the last syllable can determine the final pitch of the A-not-A questions from Example 5.18 to 5.24. In my 75 A-not-A questions, 92 per cent (69/75) display this propensity. On the other hand, the underlying lexical tone undergoes some modifications and displays different final pitch from Example 5.25 to 5.30. In my data, only 8 per cent (6/75) of A-not-A questions show different final pitch from their original underlying lexical tone. As a result of this, we suggest that the toned final syllable plays an important role in determining the final pitch of A-not-A questions in my data.

#### 5.2.4. Summary

137 yes/no questions are available in the data, including 62 *ma*-particle questions and 75 'A-not-A' questions.

Firstly, the results of the pitch movement of the last accented syllable and the subsequent unstressed syllables in the data are as follows:

- 'Fall' has the highest percentage, with 40 per cent;
- 'Fall-rise' ranks second, with 21 per cent;
- 'Fall-level' ranks third, with 18 per cent;
- 'Rise-fall' accounts for 9 percent;
- 'Rise' accounts for 7 per cent;
- 'Level-rise' and 'level-fall' have very low percentage in the data, accounting for 5

per cent in total.

It can be seen from the results that falling intonation is the dominant pitch movement of the last stressed syllable and the subsequent unstressed syllables in the map-task-type conversation. Yes/no questions are likely to display falling intonation in real-life conversation, even though falling pitch is associated with declarative intonation in Mandarin Chinese in prior research.

Only 21 per cent of the yes/no questions display a fall-rise, which has previously been regarded as the typical interrogative intonation in Mandarin Chinese. This suggests that the yes/no interrogative may have a wide range of potential pitch contours in addition to a fall-rise.

Another finding is a fall-level, which seems to be an important pitch movement of

the yes/no question, accounting for 18 per cent. This could be tentatively seen as a new finding in an examination of types of intonational patterns of yes/no questions in Mandarin conversation.

Secondly, the results of the pitch movement of the final syllable of the 137 yes/no questions in the data are:

- The terminal fall has the highest percentage, with 51 per cent;
- The terminal rise accounts for 27 per cent;
- The terminal level has the lowest percentage, with 22 per cent.

The statistical analysis shows that the yes/no questions usually have the terminal falling intonation; a terminal rise is less frequently used. Additionally, it is potential for the yes/no question to have a terminal level in Mandarin conversation.

These results are not in line with previous research. Cruttenden (1997:157) reports that it is usual for the yes/no question to have a terminal rise even in tone languages. Furthermore, Shen (1994) points out that the typical interrogative intonation is a slight rise of the bottom pitch line. Therefore, the terminal fall in this position may be an important finding for prosodic research on Mandarin Chinese conversation.

Finally, a terminal level with 22 per cent is also a new intonational observation at the end of the yes/no question, which has not been mentioned by previous research on the prosody of the interrogative intonation of Mandarin Chinese.

### **5.3. Final pitch of the turn-final declarative**

The purpose of investigating the final pitch of the turn-final declarative is to find out

whether the turn-final declaratives and 'A-not-A' interrogatives ending with toned syllables display similar patterns with regard to predictability of the final pitch from the underlying tone of the last syllable. In other words, I aim to extend an understanding of how meaningful my findings on yes/no interrogatives are by comparing the turn-final declaratives with 'A-not-A' interrogatives.

Examination of the turn-final yes/no interrogative suggests that there is a strong link between the final pitch of the 'A-not-A' interrogative and the underlying tone of the last syllable. However, my data also show that the final pitch of 6 out of 75 instances of 'A-not-A' questions ending with toned syllables (8 per cent) undergoes modifications in the sequential contexts of turn-finality. Potential triggers may be the conversational practice, speakers' attitudes or the interrogative intonation. However, there is no strong evidence that the interrogative intonation has a very significant impact on the final pitch.

The subsequent analysis of turn-final declaratives aims to find out whether the final pitch of the turn-final declaratives may undergo the same modifications as the turn-final A-not-A interrogatives.

26 instances were selected from our eight map-task-type conversations, including all possible tonal combinations between Tone0, Tone1, Tone2, Tone3, and Tone4. Among them, 25 instances are turn-final declaratives, and one turn-internal declarative is selected for comparative purposes. However, the tonal combination of Tone0 + Tone3 does not emerge in my data.

### **5.3.1. Tone0**

In the first group, the underlying tone of the last syllable is Tone0, neutral tone.

This makes relevant the declarative intonation at the end of the utterance, as the underlying tone of the neutral tone is unspecified.

Consider the following instance from Group 2.

Example 31: 明白了 (Turn 2 in Group 2)

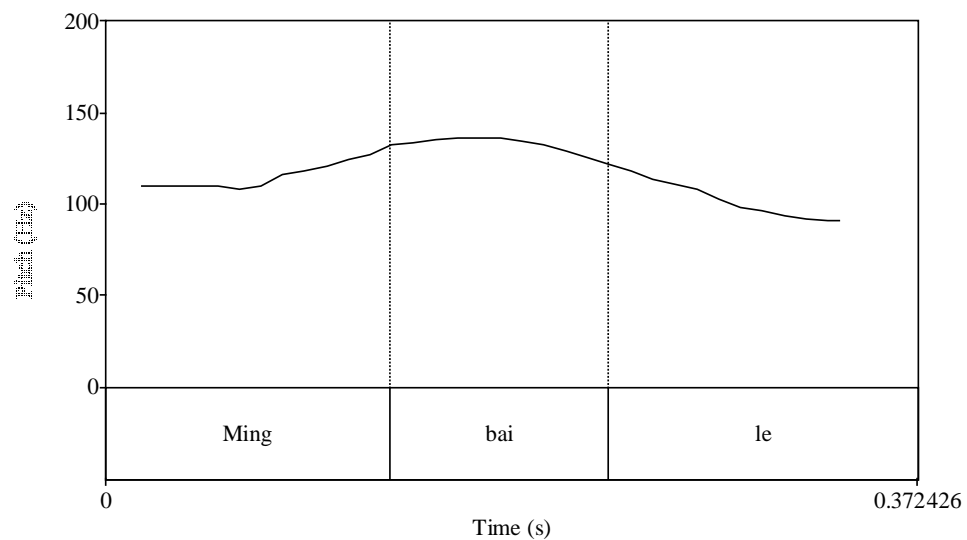
(31) Tone0 + Tone0

明白 了。

mingbai le

understand ASP

“I see.”



Graph 5. 31 Turn-final fall in *mingbai le*

It can be seen from the frequency analysis in Graph 5.31 that the last syllable of the declarative, *le* (Tone0), has a fall at the end of the utterance. In this tonal combination, the syllable of *bai* (Tone0) between the stressed syllable of *ming* (Tone2, rise) and the last

syllable of *le* serves as a transition. As a result, the pitch contour of *bai* displays a rise-fall. The rising part may be affected by the stressed syllable of *ming* (Tone2, rise), but the falling part is consistent with Shih's (1987) observation that the toneless syllable has a fall after Tone2. This instance suggests that a fall might be associated with the declarative intonation, in line with prior research on prosody of declaratives (e.g., Crurrenden 1997: 151).

Consider another instance.

Example 32: 说吧 (Turn 58 in Group 7)

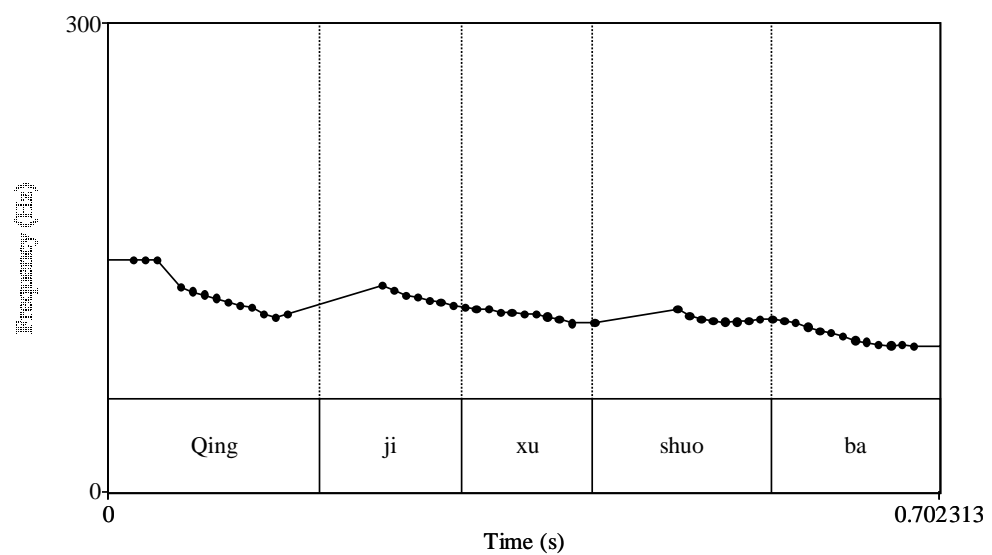
(32) Tone1 + Tone0

请 继续 说 吧。

qing jixu shuo ba

please continue speak SFP

“Please continue.”



Graph 5.32 Turn-final fall in *shuo ba*

The frequency analysis in Graph 5.32 demonstrates that the last syllable of the declarative, *ba* (Tone0), falls at the end of the turn. This is in line with prior work. Shih (1987) notes that the toneless syllable has a fall after Tone1. In addition, Crurrenden (1997: 153) reports that a terminal fall can be seen as the unmarked pattern for declarative sentences in most languages.

Example 33: 完了 (Turn 64 in Group 7)

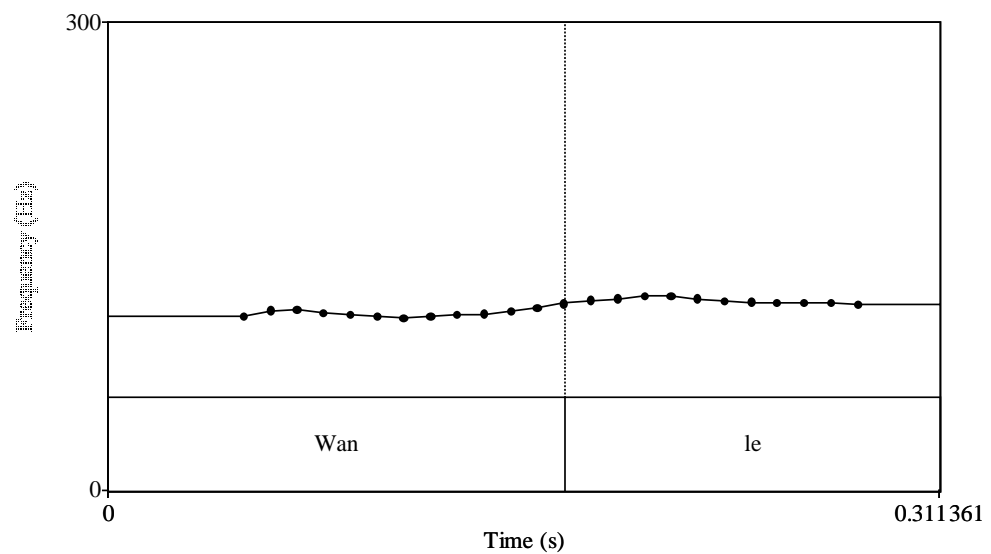
(33) Tone2 + Tone0

完 了

wan le

finish ASP

“I have done (it).”



Graph 5.33 Turn-final fall in *wan le*

The frequency analysis in Graph 5.33 illustrates that the last syllable of the declarative, *le* (Tone0), displays a minimal fall at the end of the turn. To iterate, this instance is consistent with previous research (Shih 1987, Crurrenden 1997).

Example 34: 两个 (Turn 55 in Group 2)

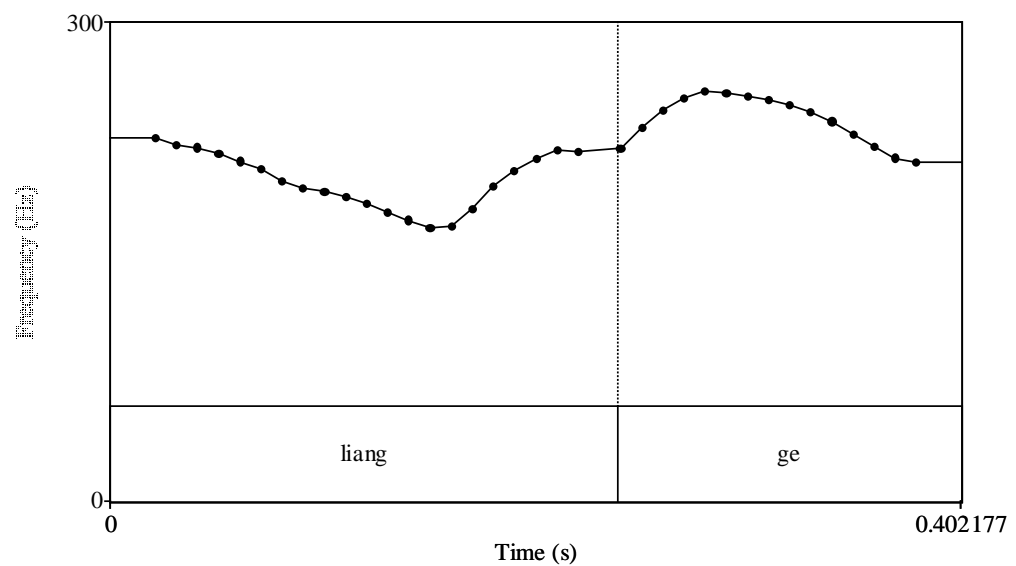
(34) Tone3 + Tone0

两 个

liang ge

two CLS

“Two.”



Graph 5. 34 Turn-final fall in *liang ge*

The frequency analysis in Graph 5.34 illustrates that the last syllable of the declarative, *ge* (Tone0), has a terminal fall at the end of the turn. Note that *ge* is a classifier in Mandarin Chinese used after numbers. This is consistent with Crurrenden’s (1997)



reports, but it is not in line with Shih's (1987) observation. Shih notes that the toneless syllable has a rise after Tone3.

Example 35: 样子 (Turn 23 in Group 6)

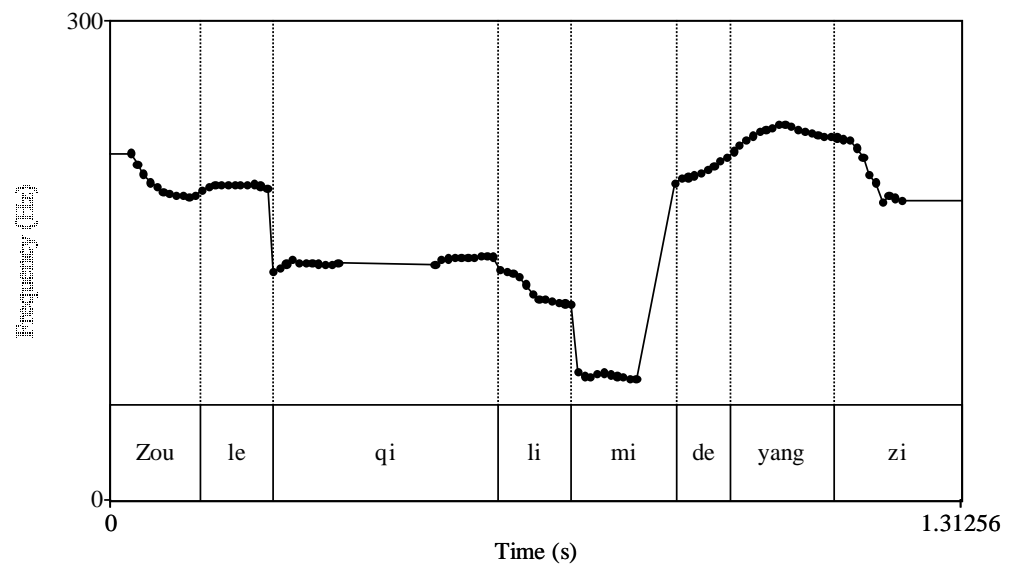
(35) Tone4 + Tone0

走 了 7 厘米 的 样子。

zou le qi limi de yangzi

walk ASP seven centimeters PT approximately

“Walk approximately seven centimeters.”



Graph 5.35 Turn-final fall in *yangzi*

The frequency analysis in Graph 5.35 illustrates that the last syllable of the declarative, *zi* (Tone0), has a fall at the end of the turn. This is consistent with prior work on neutral tone and the declarative intonation (Shih 1987, Cruttenden 1997). Once again, note that there appears to be a pitch tracking error in the pitch plot, as the pitch suddenly jumps

from 75 Hertz to 223 Hertz.

To summarize, the final pitch of the five declaratives ending with neutral tone displays a fall regardless of the underlying tone of the preceding syllable. In other words, the analysis of my data suggests that the preceding underlying tone does not have any effect on the final pitch of the declaratives turn-finally in the map-task-type conversation in Mandarin Chinese. When the last syllable of the declarative is neutral tone without any tonal specification, the declarative intonation can be observed as a fall in my data.

### 5.3.2. Tone1

In the second group, the underlying tone of the last syllable is Tone1 (55, level). The final pitch is supposed to be a level, given that the underlying tone of the last syllable retains its original tonal shape at the end of the turn-final declarative.

The first instance has the tonal combination of Tone0 + Tone1.

Example 36: (一)个弯 (Turn 17 in Group 1)

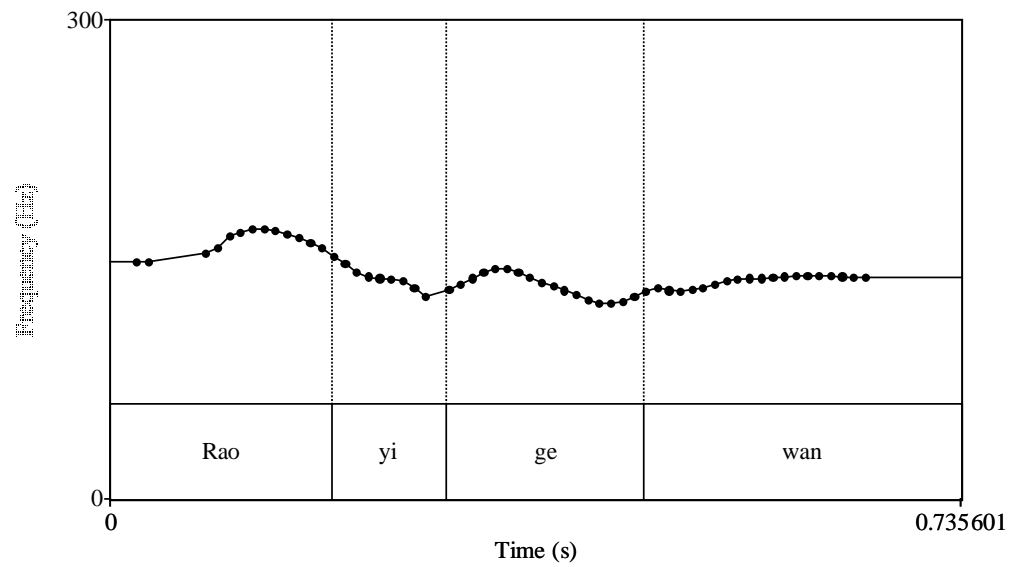
(36) Tone0 + Tone1

绕 — 个 弯。

rao yi ge wan

round one CLS curve

“Round one curve.”



Graph 5.36 Turn-final level in *yige wan*

The frequency analysis in Graph 5.36 illustrates that the final pitch contour of the declarative is a level, in line with the underlying tone of the last syllable of *wan* (Tone1, a level).

Example 37: 一边 (Turn 88 in Group 3)

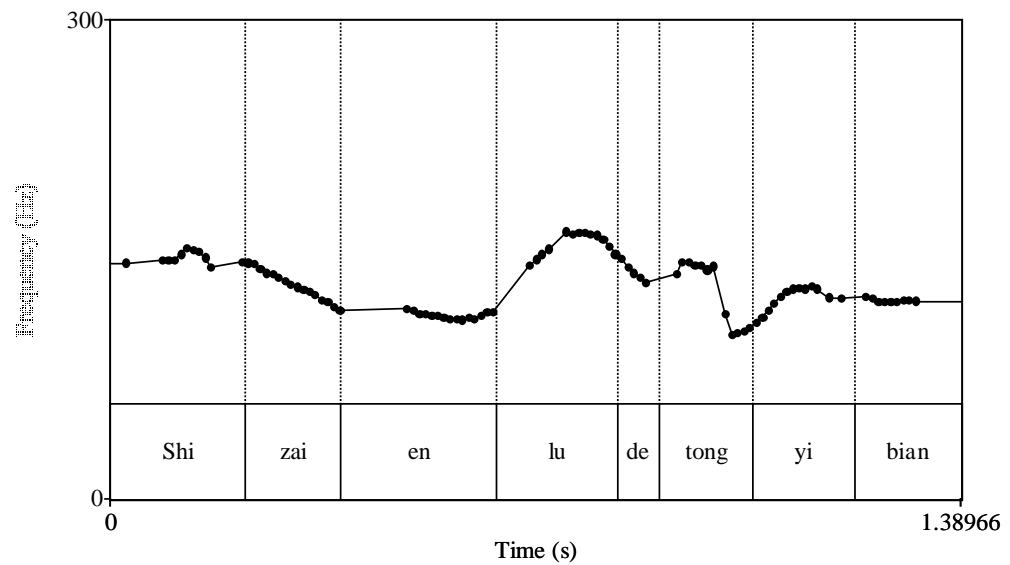
(37) Tone1 + Tone1

是 在 嗯: 路 的 同 一 边。

Shi zai en lu de tong yi bian

COP be:in en road PT same one side

“(It) is en:: on the same side of the road.”

Graph 5. 37 Turn-final level in *yi bian*

The frequency analysis in Graph 5.37 illustrates that the final pitch contour of the declarative is a level, consistent with the underlying tone of the last syllable of *bian* (Tone1, a level). Note that *en* in the middle of the utterance can be understood as a self-interruption (Schegloff, 1996).

Example 38: 石圈 (Turn 4 in Group 8)

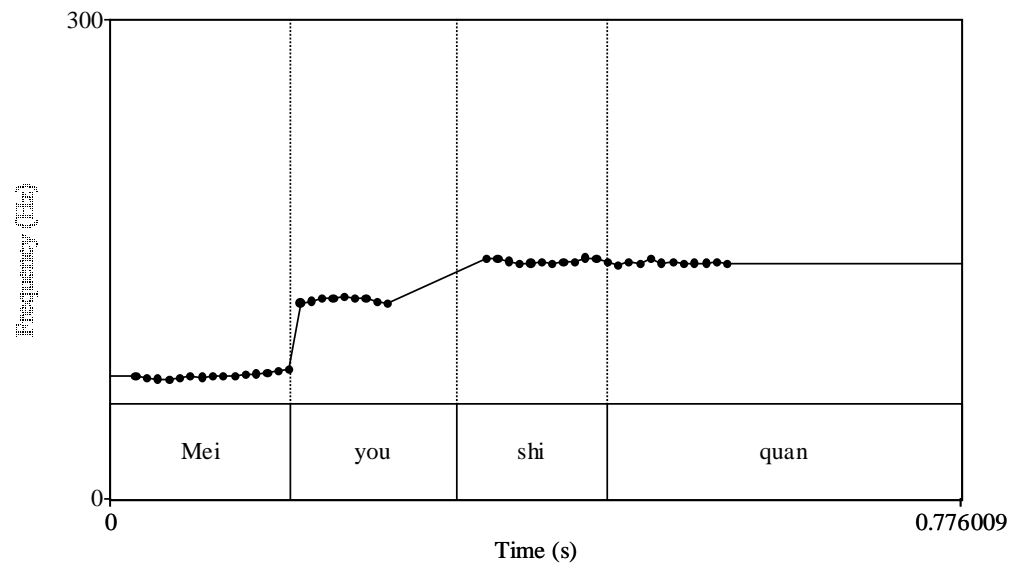
(38) Tone2 + Tone1

没 有 ‘石圈’。

mei you shiquan

NEG have stone:circle

“(I) haven’t got the ‘Stone Circle’.”



Graph 5. 38 Turn-final level in *shiquan*

The frequency analysis in Graph 5.38 illustrates that the final pitch contour of the declarative is a level, consistent with the underlying tone of the last syllable of *quan* (Tone1, level).

Example 39: 等腰 (Turn 53 in Group 7)

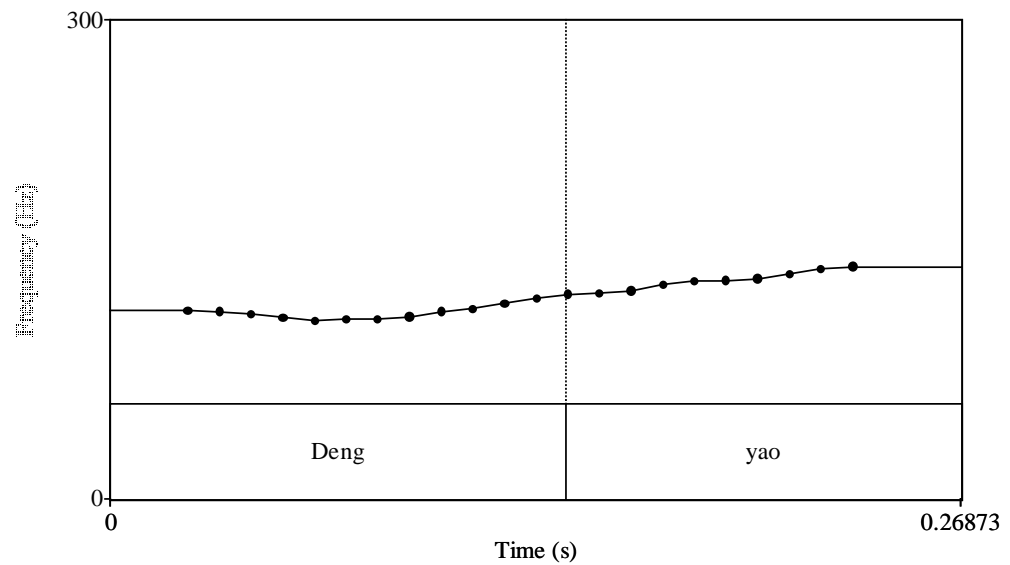
(39) Tone3 + Tone1

等 腰。

deng yao

same length

“The same length.”



Graph 5.39 Turn-final level in *dengyao*

The frequency analysis in Graph 5.39 illustrates that the final pitch contour of the declarative is a level, consistent with the underlying tone of the last syllable of *yao* (Tone1, level). The difference between the highest and the lowest pitch of the last syllable of *yao* is 8 Hertz (137 – 145 Hertz), less than 10 Hertz. Therefore, in spite of the representation in the frequency analysis as slightly rising, it can be classified as a level. In addition, the perception test confirms that it is a level, not a rise.

Example 40: 地方 (Turn 3 in Group 6)

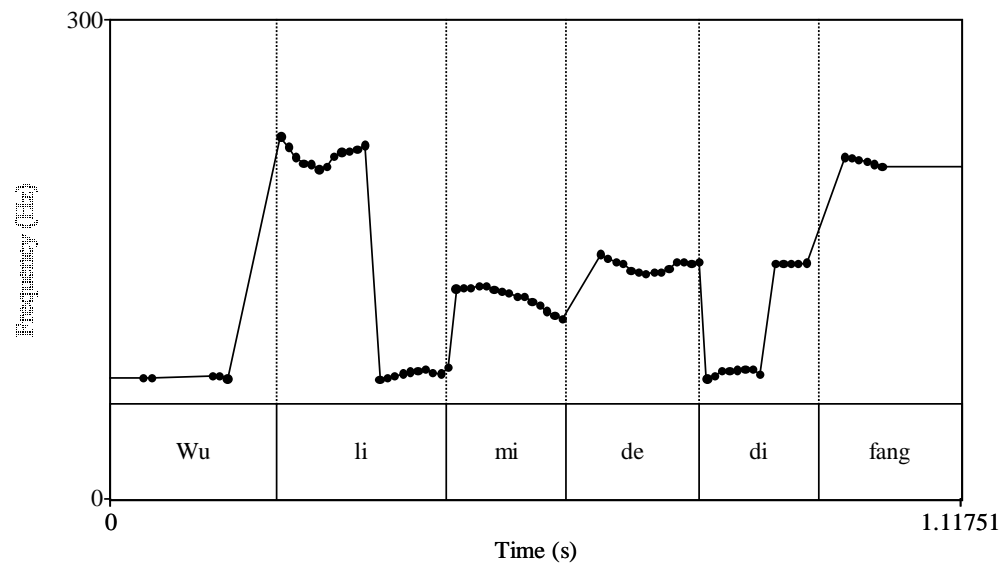
(40) Tone4 + Tone1

5 厘米 的 地方。

wu limi de difang

five centimeters PT place

“The place where it is five centimeters away.”



Graph 5.40 Turn-final level in *difang*

The frequency analysis in Graph 5.40 illustrates that the final pitch contour of the declarative is a level, consistent with the underlying tone of the last syllable of *fang* (Tone1, level). The difference between the highest and the lowest pitch of the last syllable of *fang* is 7 Hertz (207 – 214 Hz), less than 10 Hertz. Therefore, it can again be classified as a level. Similarly, the perception test confirms that it is a level, not a fall. It is noteworthy that there appears to be a pitch tracking error in the pitch plot, as the pitch suddenly jumps from 75 Hertz to 227 Hertz.

To summarize, the frequency analysis of my data demonstrates that the underlying tone of Tone1 (55, level) at the end of declaratives has a terminal level at the end of the turn. In other words, it seems that the pitch of the underlying tone plays an important role in the final pitch of the turn-final declaratives in Mandarin Chinese.

### 5.3.3. Tone2

In the third group, all the underlying tone of the last syllable is Tone2 (35, rising).

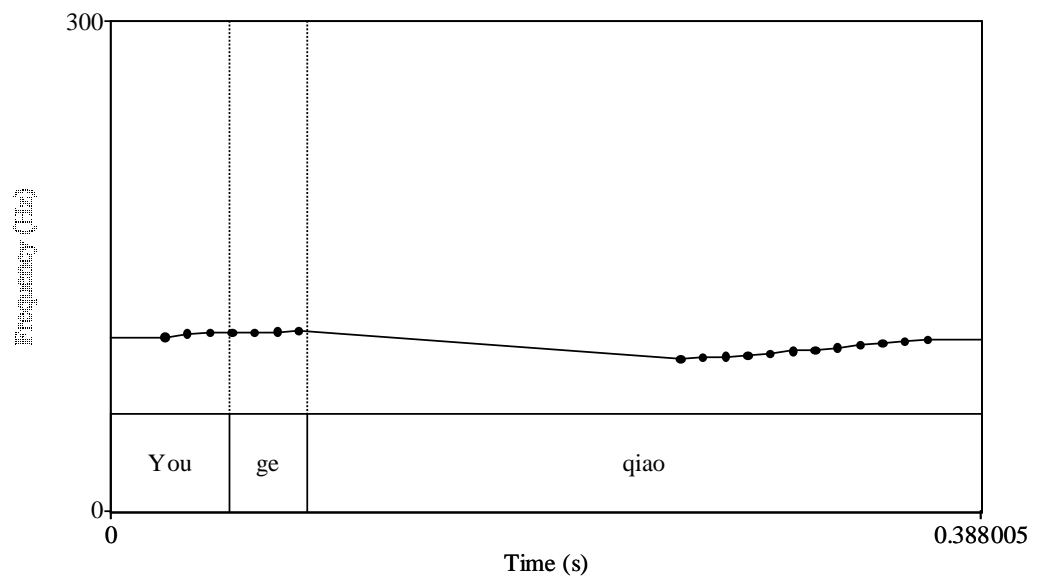
The final pitch is supposed to be a rise provided that the underlying tone of the last syllable retains its original tonal shape at the end of the turn-final declarative.

Example 41: 个桥 (Turn 8 in Group 7)

(41) Tone0 + Tone2

有	个	桥。
you	ge	qiao
have	CLS	bridge

“There is a bridge.”



Graph 5. 41 Turn-final rise in *you ge qiao*

It can be seen from the frequency analysis in Graph 5.41 that the final pitch contour of the turn-final declarative is a slight rise, consistent with the underlying tone of the last syllable of the utterance, *qiao* (Tone2, 35, rise). This is in line with prior research on



prosody of Mandarin Chinese.

Example 42: 溪流 (Turn 15 in Group 4)

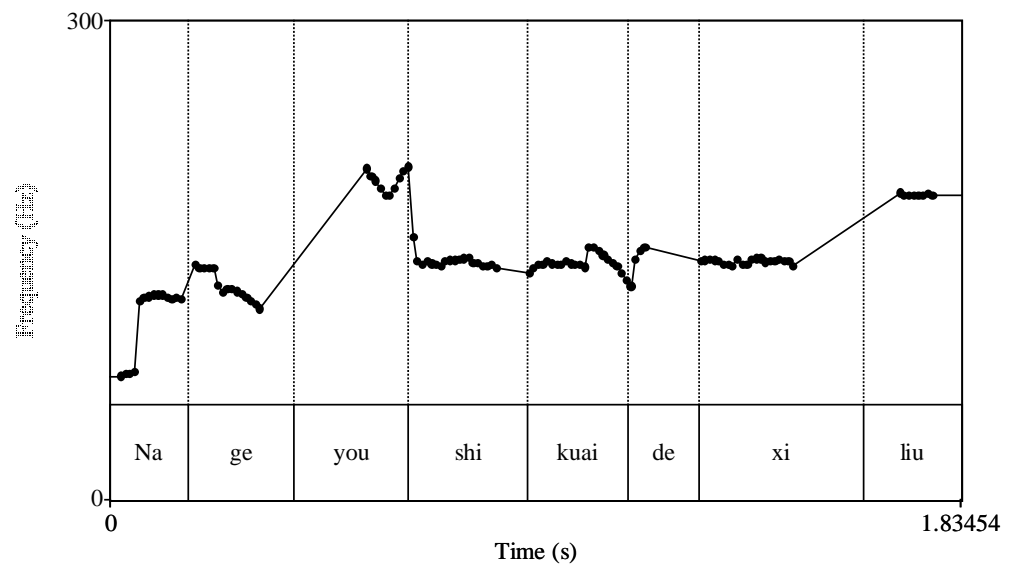
(42) Tone1 + Tone2

那 个 ‘有石块的溪流’：

na ge you shikuaide xiliu

that CLS stone:creek

“That ‘Stone Creek’.”



Graph 5. 42 Turn-final level in *xiliu*

The frequency analysis in Graph 5.42 illustrates that the final pitch contour of the turn-final declarative is a level, which is not consistent with the underlying tone of the last syllable of the statement, *liu* (Tone2, 35, rise). The final syllable is unstressed and its final pitch undergoes modifications in this instance.

Example 43: 岩石 (Turn 5 in Group 6)

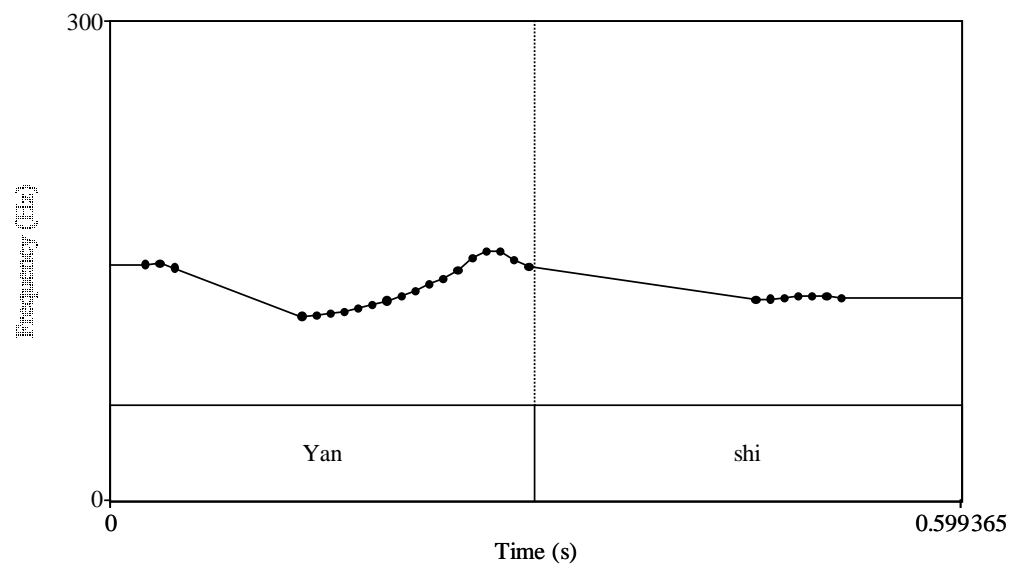
(43) Tone2 + Tone2

岩石。

yanshi

stones

‘Stones.’



Graph 5.43 Turn-final level in *yanshi*

The turn-final pitch movement of this declarative is a level at the end of the turn (see Graph 5.43). This is not consistent with previous claim that the declarative ending in Tone2 has a terminal rise.

Example 44: 绳索桥 (Turn 60 in Group 3)

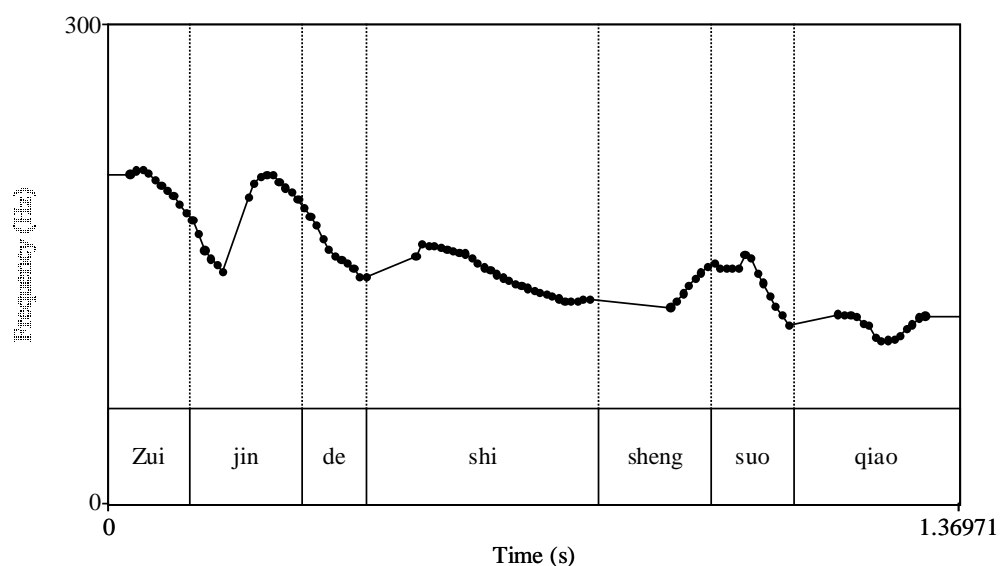
(44) Tone3 + Tone2

最近的是‘绳索桥’。

zui jin de shi shengsuoqiao

most close PT COP rope:bridge

“‘Rope Bridge’ is the closest.”



Graph 5.44 Turn-final rise in *shengsuoqiao*

It can be seen from the frequency analysis in Graph 5.44 that the final pitch contour of the turn-final declarative is a rise, in line with the underlying tone of the last syllable of the statement, *qiao* (Tone2, 35, rise).

Example 45: 瞪羚 (Turn 46 in Group 3)

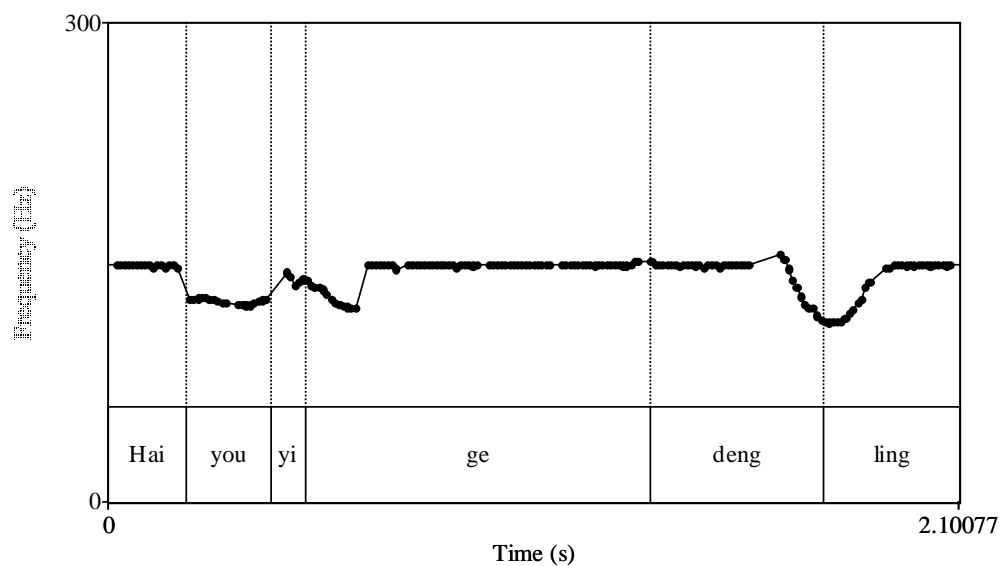
(45) Tone4 + Tone2

还 有 一 个 ‘瞪羚’：

hai you yi ge dengling

still have one CLS gazelles

“I have another place known as ‘Gazelles’.”



Graph 5. 45 Turn-final level in *dengling*

The frequency analysis in Graph 5.45 illustrates that the final pitch contour of the turn-final declarative is a level, inconsistent with the underlying tone of the last syllable of the statement, *ling* (Tone2, 35, a rise).

To summarize, the analysis of my data suggests that the final pitch of the declaratives turn-finally ending with Tone2 displays a rise in general, as predicated from the underlying tone of the last syllable of the statement. It seems that the underlying tone of the last syllable of the declarative plays a key role in the final pitch of the turn-final statement in most cases. On the other hand, when Tone1, Tone2 and Tone4 are adjacent with Tone2, the final pitch of the declarative displays a terminal level as a result of modifications.

#### 5.3.4. Tone3

In the fourth group, the underlying tone of the last syllable is Tone3 (214, fall-rise). The final pitch is supposed to be fall-rise if the underlying tone of the last syllable retains

its original tonal shape at the end of the turn-final declarative.

Example 46: 终点 (Turn 25 in Group 4)

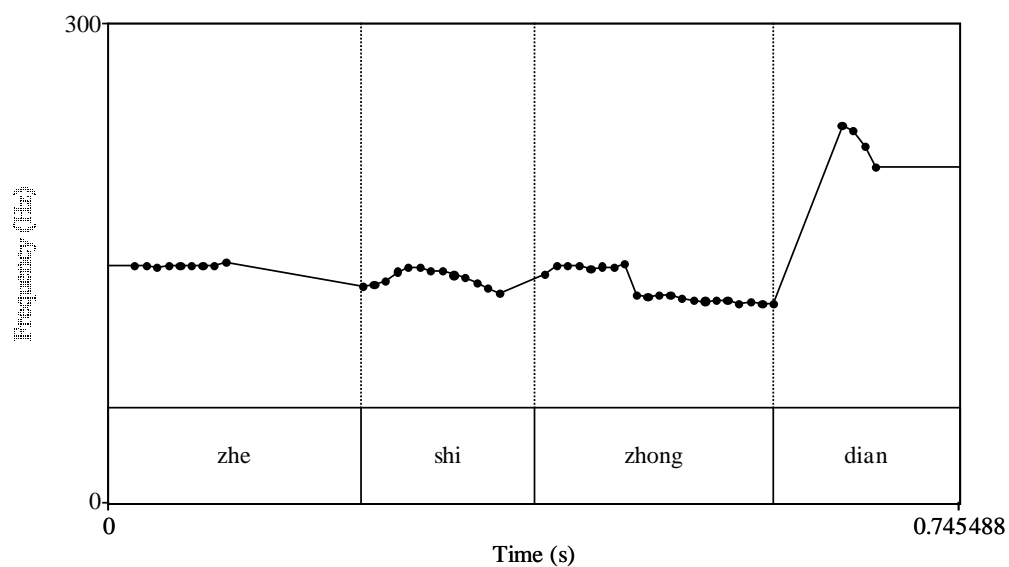
(46) Tone1 + Tone3

就 是 ‘终点’ 。

jiu shi zhongdian

just COP finish:point

“Just the ‘Finish Point’.”



Graph 5. 46 Turn-final fall in *zhongdian*

It can be seen that the frequency analysis in Graph 5.46 displays that the final pitch of the declarative has a fall. This instance shows that the underlying tone of the last syllable, *dian* (Tone3, 214, fall-rise), is not fully realized at the end of the turn. In this case, the falling part is realized, but the rising part is not after the preceding Tone1 (55, a level).

Example 47: 白水 (Turn 17 in Group 4)

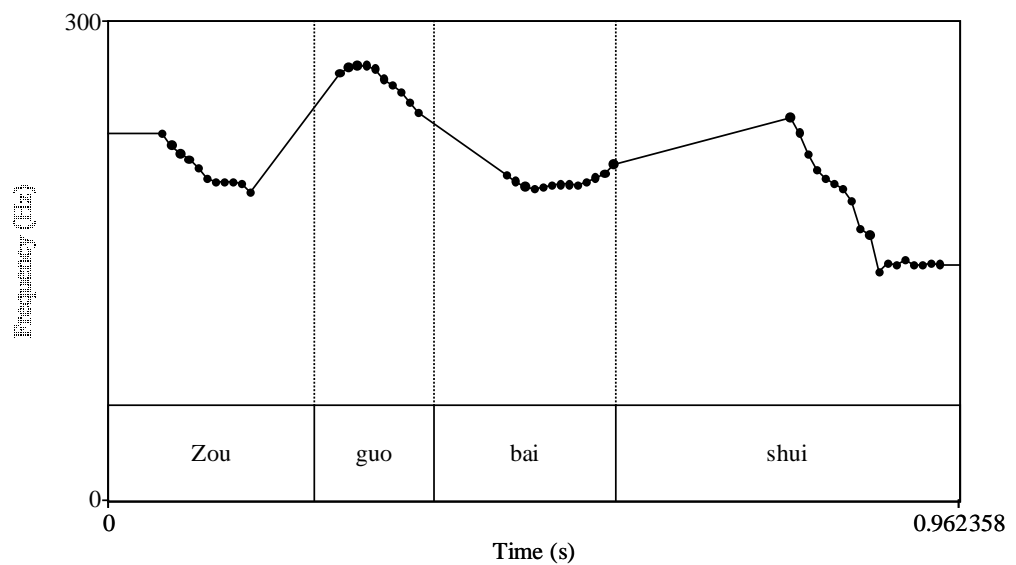
(47) Tone2 + Tone3

走 过 ‘白水’

zou guo baishui

walk past white:water'

“Walk past the ‘White Water’.”



Graph 5.47 Turn-final fall in *baishui*

The frequency analysis in Graph 5.47 illustrates that the turn-final declarative has a fall like its prominent part over the pitch range of the last syllable. In fact, the underlying tone of the last syllable of the statement, *shui* (Tone3, 214, fall-rise), is not fully realized, either. The rising part is present, but the falling part is realized as a level.

Example 48: 左走 (Turn 37 in Group 3)

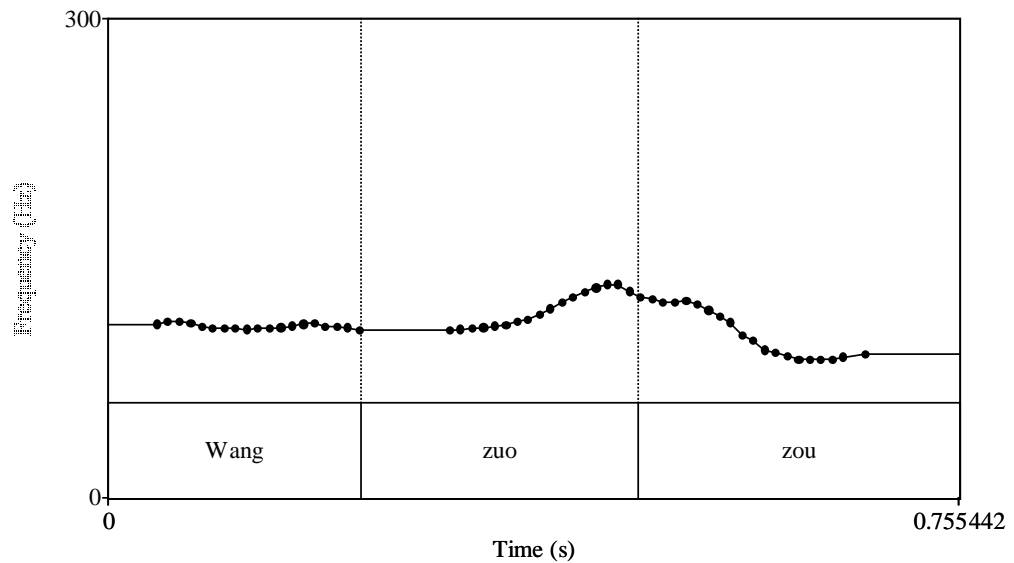
(48) Tone3 + Tone3

往 左 走。

wang zuo zou

toward left walk

“Walk leftwards.”



Graph 5.48 Turn-final fall in *zuozou*

It can be seen from the frequency analysis in Graph 5.48 that the final pitch of the turn-final declarative is a fall. As a matter of fact, the underlying tone of the last syllable of the statement, *zou* (Tone3, 214, fall-rise), is not fully realized in the conversation. It should be noted that this is a case in which the tone sandhi rule applies. When the underlying tonal combination is Tone3 + Tone3, the surface becomes Tone2 + Tone3. In this case, the adjacent syllable of *zuo* (Tone3) becomes a rise (Tone2) due to the tone sandhi rule. On the other hand, the falling part of the last Tone3 syllable of *zou* is realized, but not the rising part.

Example 49: 下走 (Turn 20 in Group 6)

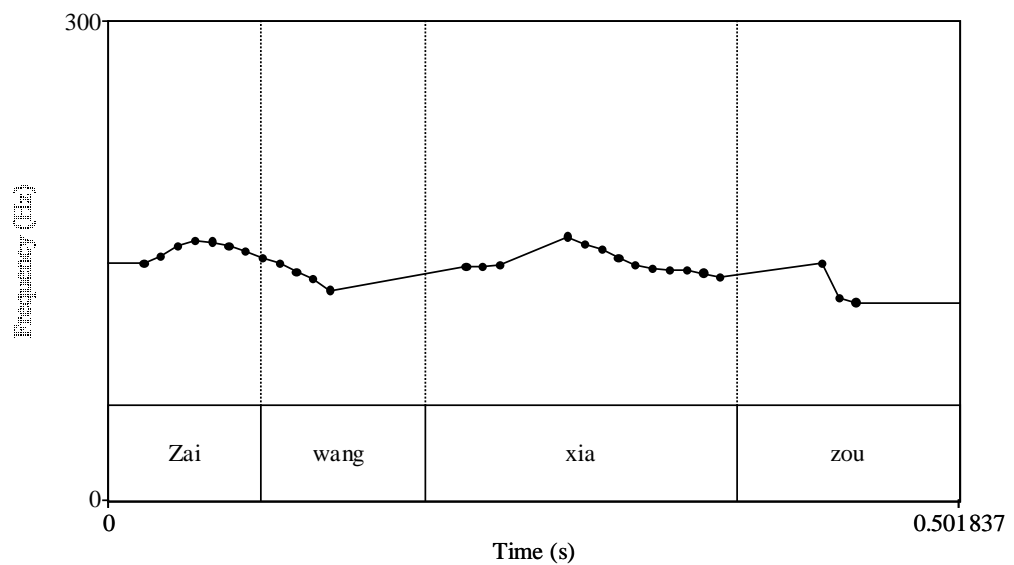
(49) Tone4 + Tone3

再 往 下 走。

zai wang xia zou

again toward down walk

“Walk downwards, again.”



Graph 5.49 Turn-final fall in *xia zou*

The frequency analysis in Graph 5.49 illustrates that the final pitch contour of the turn-final declarative is a fall. This shows that the underlying tone of the last syllable of the statement, *zou* (Tone3, 214, fall-rise), is not fully realized. To iterate, the falling part is produced, but the rising part is not articulated.

To summarize, the analysis of our data shows that the underlying tone of the last syllable of Tone3 is not fully realized in the final pitch of the declarative in the conversation. In reality, only the falling part is articulated, but the rising part is



suppressed regardless of the underlying tonal shape of the preceding syllable. In this group, the underlying tone of the last syllable has some effect on the final pitch of the declarative at the end of a turn. However, the rising part is not always realized.

### 5.3.5. Tone4

In the fifth group, the underlying tone of the last syllable is Tone4 (51, fall). The final pitch should be realized as a fall, provided that the underlying tone of the last syllable retains its original tonal shape at the end of the turn-final declarative.

Example 50: 的话 (Turn 53 in Group 2)

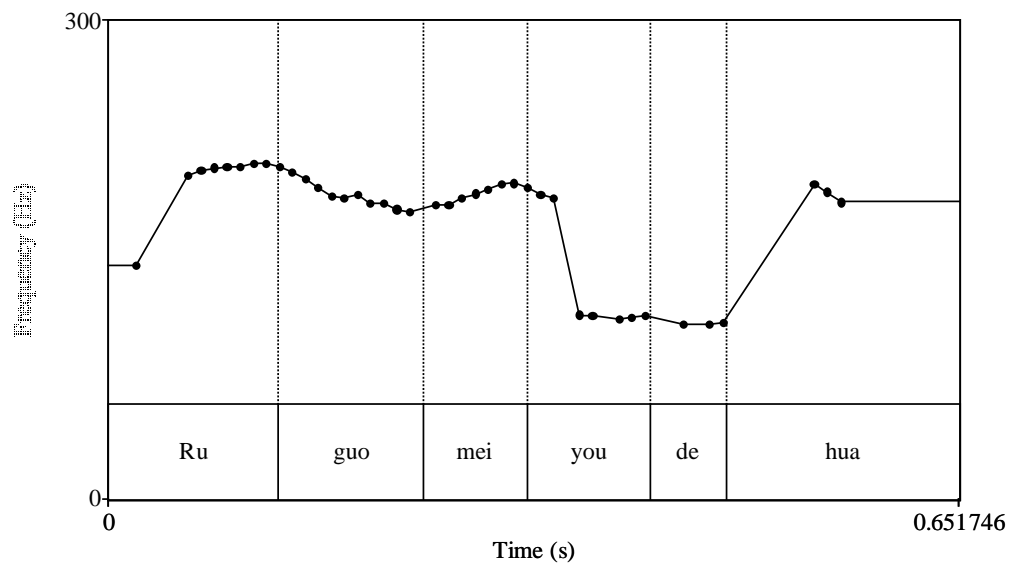
(50) Tone0 + Tone4

如果 没 有 的话。

ruguo mei you dehua

if NEG have in:the:case:of

“If there is nothing”



Graph 5.50 Turn-final fall in *dehua*

It can be seen from the frequency analysis in Graph 5.50 that the final pitch contour of the turn-final declarative is a fall, as predicted from the underlying tone of the last syllable of the statement, *hua* (Tone4, 51, fall).

Example 51: 耕地 (Turn 11 in Group 1)

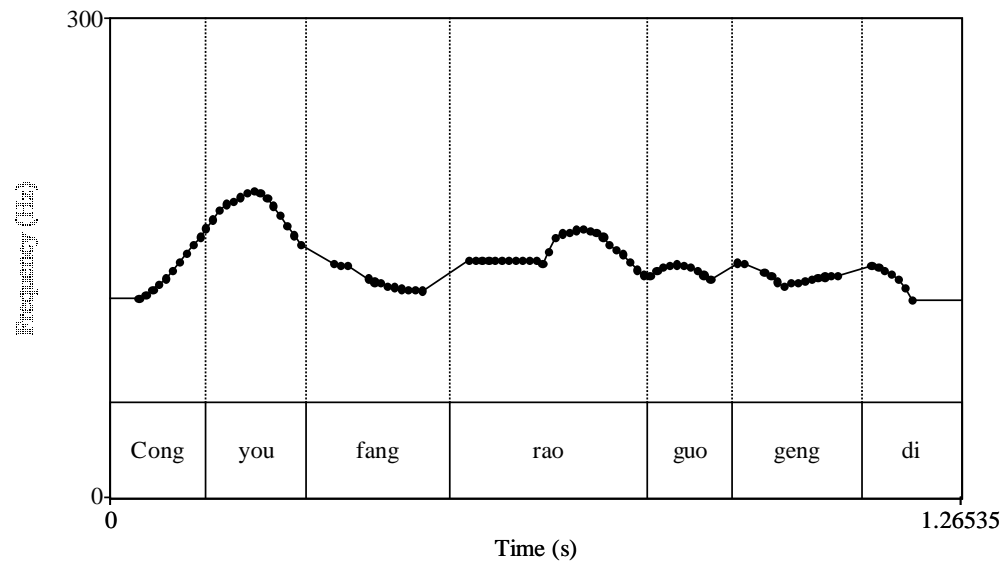
(51) Tone1 + Tone4

从 右方 绕过 耕地。

cong youfang raoguo gengdi

from right round farmed:land'

“Round the ‘Farmed Land’ from the right.”



Graph 5.51 Turn-final fall in *gengdi*

The frequency analysis in Graph 5.51 illustrates that the final pitch of the declarative turn-finally displays a fall, in line with the underlying tone of the last syllable of the

statement, *di* (Tone4, 51, fall).

Example 52: 石块 (Turn 80 in Group 3)

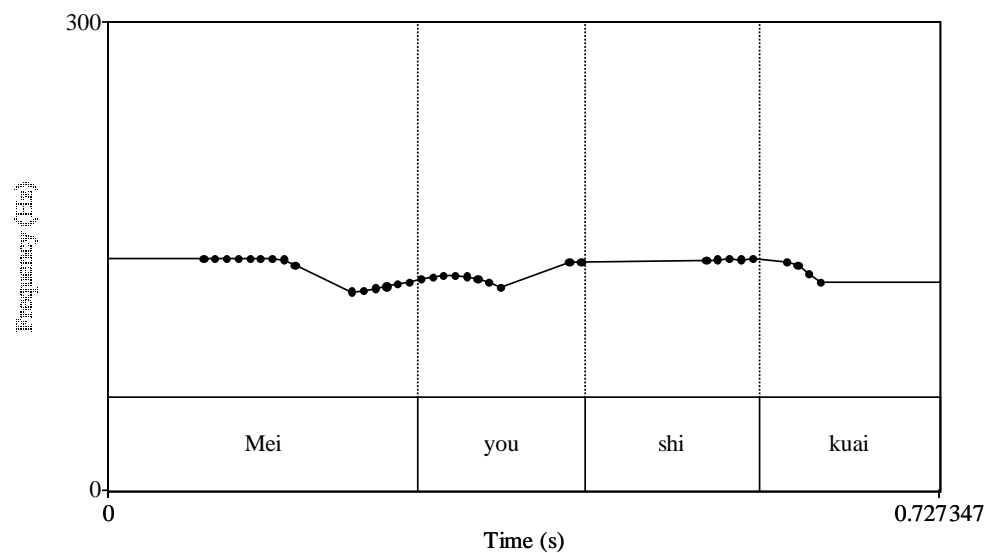
(52) Tone2 + Tone4

没 有 ‘石块’

mei you shikuai

NEG have stones

“There are not any stones (on my map).”



Graph 5.52 Turn-final fall in *shikuai*

It can be seen from the frequency analysis in Graph 5.52 that the final pitch of the turn-final declarative shows a fall, consistent with the underlying tone of the last syllable of the statement, *kuai* (Tone4, 51, a fall).

Example 53: 死木 (Turn 31 in Group 2)

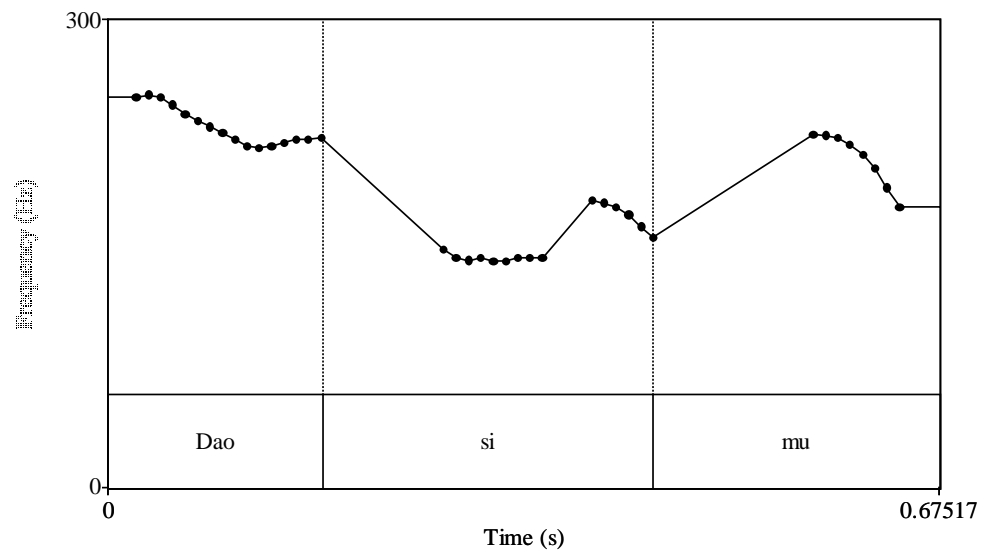
(53) Tone3 + Tone4

到 ‘死木’

dao simu

reach dead:tree

“Reach the ‘Dead Tree’.”

Graph 5. 53 Turn-final fall in *simu*

The frequency analysis in Graph 5.53 illustrates that the final pitch contour of the declarative turn-finally is a terminal fall, as predicted from the underlying tone of the last syllable of the statement, *mu* (Tone4, 51, fall).

Example 54: 大概 (Turn 42 in Group 7)

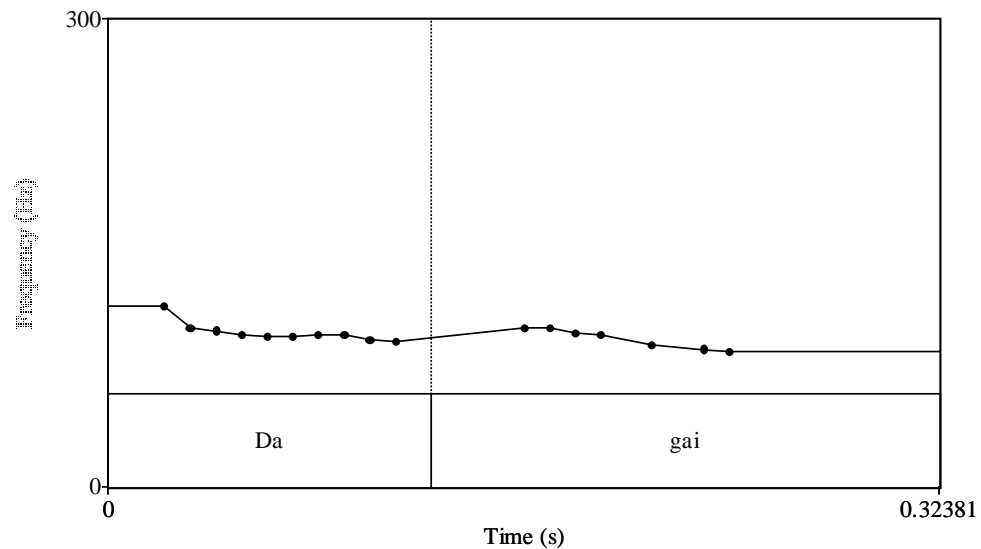
(54) Ton4 + Tone4

大概。

dagai

approximately

“Approximately.”



Graph 5. 54 Turn-final fall in *dagai*

It can be seen from the frequency analysis in Graph 5.54 that the final pitch of the turn-final declarative shows a terminal fall, aligned with the underlying tone of the last syllable of the utterance, *gai* (Tone4, 51, fall).

To summarize, the frequency analysis of my data suggests that the final pitch of the turn-final declaratives ending in Tone4 is consistent with the underlying tone of the last syllable of the utterance. In other words, it seems that the underlying tone of the last syllable of the statement plays a vital role in shaping the final pitch of the declarative in the conversation.

When the last syllable of the turn-final declarative is Tone1 (level), Tone2 (rise) and Tone4 (fall), the final pitch of the declarative is consistent with the underlying tone of last syllable of the statement. When the last syllable of the turn-final declarative is Tone3

(fall-rise), the final pitch of the declarative shows a fall, but the rising part is not always realized at the end of the turn.

Like the A-not-A interrogatives, the final pitch of the declarative undergoes modification in some cases. Consider the following instance.

Example 55: 车轮 (Turn 2 in Group 6)

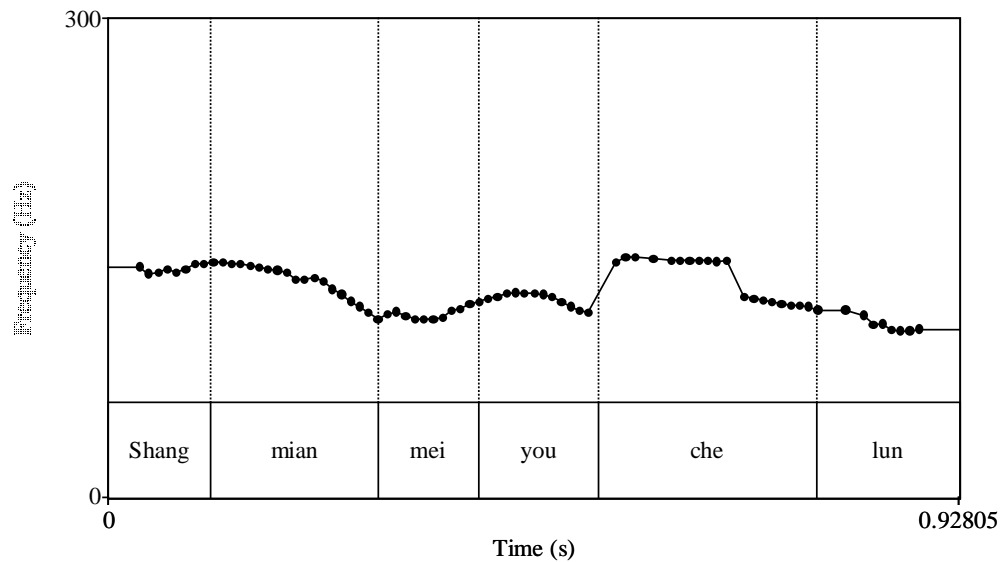
(55) Tone1 + Tone2

上面 没 有 ‘车轮’。

shangmian mei you chelun

above NEG have wagon:wheel

“There is not any ‘Wagon Wheel’ above.”



Graph 5.55 Turn-final fall in *chelun*

The frequency analysis in Graph 5.55 illustrates that the final pitch of the turn-final declarative displays a slight fall, inconsistent with the underlying tone of the last syllable

of the statement. This implies that the final pitch of declaratives may undergo modifications in Mandarin Chinese conversations.

On the other hand, when the same phrase *chelun* emerges in the middle of the turn, the final pitch of the declarative displays a rise, rather than a fall. Consider the following turn-internal declarative in my data.

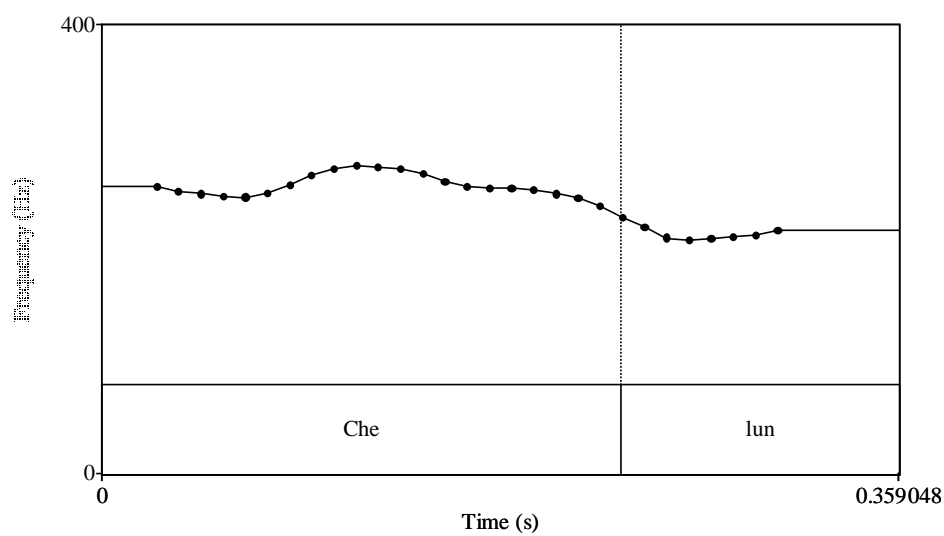
Example 56: 车轮 (Turn 11 in Group 4)

(56) 车轮。

chelun

wagon:wheel

“Wagon Wheel.”



Graph 5. 56 Turn-internal rise in *chelun*

It can be seen from the frequency analysis in Graph 5.56 that the final pitch of the turn-internal declarative consisting of a noun phrase shows a slight terminal rise, aligned

with the underlying tone of the last syllable of the statement. This instance suggests that the final pitch of the declarative may be sensitive to its sequential position in conversation.

Compared with the A-not-A interrogative intonation, the analysis of my data suggests that there is no distinct difference between the A-not-A sentence and the declarative sentence in terms of the final pitch of the utterance at ends of turns. In most cases, the underlying tone of the last syllable of the utterance plays a significant role in shaping the final pitch of both the A-not-A and declarative sentences in map-task-type conversations in Mandarin Chinese. This implies that my findings for the turn-final intonation pattern of the 'A-not-A' interrogatives are not so significant as those for the *ma*-particle questions.

Finally, I will present a summary of the underlying lexical tone of the preceding accented syllable and the final unstressed syllable and the final intonation of the declarative as well as the sequential placement and the pragmatic function of declaratives.



Table 5. 4 Summary of declaratives

Example Number	Accented and final syllables	Lexical tone of last syllable	Final intonation	Sequential placement	Pragmatic function
5.31	<i>mingbai le</i>	(Tone2+)Tone0	Fall	Final	To make an assertion
5.32	<i>shuoba</i>	(Tone1+)Tone0	Fall	Final	To make an assertion
5.33	<i>wanle</i>	(Tone2+)Tone0	Fall	Final	To make an assertion
5.34	<i>liangge</i>	(Tone3+)Tone0	Fall	Final	To make an assertion
5.35	<i>yangzi</i>	(Tone4+)Tone0	Fall	Final	To make an assertion
5.36	<i>(yi)gewan</i>	Tone1 55 Level	Level	Final	To make an assertion
5.37	<i>yibian</i>	Tone1 55 Level	Level	Final	To make an assertion
5.38	<i>shiquan</i>	Tone1 55 Level	Level	Final	To make an assertion
5.39	<i>dengyao</i>	Tone1 55 Level	Level	Final	To make an assertion
5.40	<i>difang</i>	Tone1 55 Level	Level	Final	To make an assertion
5.41	<i>youge qiao</i>	Tone2 35 Rise	Rise	Final	To make an assertion
★5.42	<i>xiliu</i>	<b>Tone2 35 Rise</b>	<b>Level</b>	Final	To make an assertion
★5.43	<i>yanshi</i>	<b>Tone2 35 Rise</b>	<b>Level</b>	Final	To make an assertion
5.44	<i>shengsuoqiao</i>	Tone2 35 Rise	Rise	Final	To make an assertion
★5.45	<i>dengling</i>	<b>Tone2 35 Rise</b>	<b>Level</b>	Final	To make an assertion
★5.46	<i>zhongdian</i>	<b>Tone3 214 Fall-rise</b>	<b>Fall</b>	Final	To make an assertion
★5.47	<i>baishui</i>	<b>Tone3 214 Fall-rise</b>	<b>Fall</b>	Final	To make an assertion
★5.48	<i>zuozou</i>	<b>Tone3 214 Fall-rise</b>	<b>Fall</b>	Final	To make an assertion
★5.49	<i>xiazou</i>	<b>Tone3 214 Fall-rise</b>	<b>Fall</b>	Final	To make an assertion
5.50	<i>dehua</i>	51 Fall	Fall	Final	To make an assertion
5.51	<i>gendi</i>	51 Fall	Fall	Final	To make an assertion
5.52	<i>shikuai</i>	51 Fall	Fall	Final	To make an assertion
5.53	<i>simu</i>	51 Fall	Fall	Final	To make an assertion
5.54	<i>dagai</i>	51 Fall	Fall	Final	To make an assertion
★5.55	<i>chelun</i>	<b>35 Rise</b>	<b>Fall</b>	Final	To make an assertion
5.56	<i>chelun</i>	<b>35 Rise</b>	Rise	Non-final	To make an assertion

From Table 5.5, firstly, it is noteworthy that the final pitch of declaratives display a fall when the last syllable is the neutral tone. Secondly, in 33 per cent (7/21) of 21 instances, the lexical tone of the last toned syllable does not determine the final pitch of the declarative. Thirdly, in 67 per cent (14/21) of 21 instance, the lexical tone of the last toned syllable determines the final pitch of the declarative. I therefore suggest that the lexical tone of the last toned syllable plays a significant role in the final pitch of the

declarative in my data. Another observation is that sequential placement might be a possible cause for the change of the final pitch of the declarative from its original lexical tone, such as Example 5.55 and 5.56.

#### **5.4. Turn-final and turn-internal yes/no questions**

The central research question of this study is the role of turn-final prosody in interrogatives in Mandarin Chinese conversation. The comparison between turn-internal and turn-final yes/no questions may contribute to an understanding of this research question. There has been some research on the correlation between prosody and turn delimitations in non-tone languages. Studies have shown how different combinations of segmental and prosodic parameters are systematically deployed to shape the beginnings, continuations, restarts and endings of turns (Selting 1992; Couper-Kuhlen 2001; Ogden 2001).

In total, 137 yes/no questions are available in the small data set, with 25 turn-internal questions and 112 turn-final questions. Three pitch movements have been identified in both turn-internal and turn-final yes/no questions: rising, falling and level. The following figure illustrates the comparison between the turn-internal and turn-final yes/no questions in terms of the pitch movement of the final syllable.

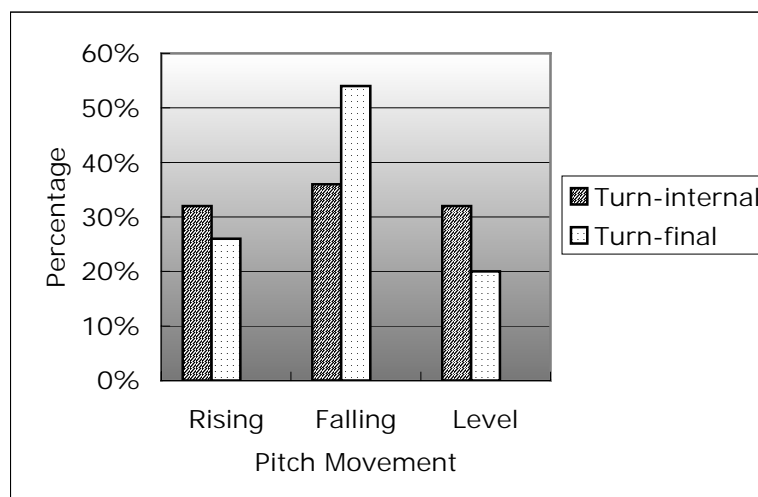


Figure 5. 3 Pitch movement of the final syllable of turn-internal and turn-final yes/no questions in Mandarin Chinese conversation

As illustrated in Figure 5.3, the comparison between the turn-internal and turn-final yes/no questions in terms of the pitch movement of the final syllable demonstrates that the intonation patterns might be relevant to possible turn completions. The terminal falling intonation can be understood to be more frequently deployed in turn-final yes/no questions, accounting for 54 per cent.

Past research suggests that pitch movement might be locally associated with signals of the possible transition-relevance places in conversation in some European languages. According to Chafe (1980) and Ford and Thompson (1996), a low fall at the end of a statement and a high rise at the end of a question can be seen as signs of projecting possible finality in English conversation. Similarly, Du Bois et al. (1993) claim that the falling intonation contour may be associated with the end of a sentence or the end of a discourse unit including the end of a turn. Their view implies that other pitch contours such as rising or level suggest incompleteness, i.e., turn continuation. However, in

Mandarin Chinese, a terminal fall of the yes/no question is more frequently used at the end of a turn in my data. Whether this can be found in ordinary conversation in Mandarin Chinese or not is a further research question for a time when more data are available.

On the other hand, a terminal rise (32 per cent) and level (32 per cent) are more frequently found in the middle of the turn from an examination of the limited number of turn-internal yes/no questions in my data set. This suggests that a terminal rise or level of the yes/no question might be correlated with holding the floor or turn continuation.

Overall, the comparison also displays that both the turn-internal and turn-final yes/no questions have a very high proportion of the terminal falling intonation. In other words, there is no significant difference found in terms of the final pitch movement of the last syllable between the turn-internal and turn-final yes/no questions.

Consider the same yes/no question at the end of a turn, which displays different final pitch movements.

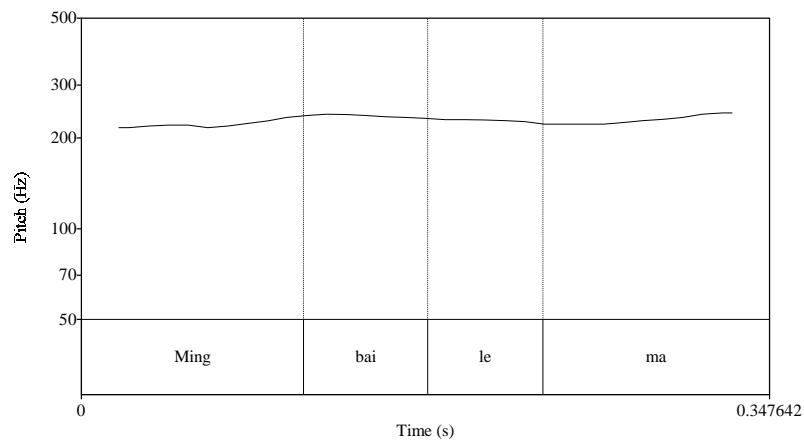
Example 57: 明白了吗 (Turn 1 in Group 2)

(57) 明白      了      吗 ?

mingbai      le      ma?

understand      ASP      QP

“(Do you) see (what mean)?”



Graph 5.57 Turn-final level-rise in *mingbai le ma*

The frequency analysis in Graph 5.57 illustrates that the pitch keeps level over the toneless syllables, *bai* and *le*, but it increases slightly over the question particle, *ma*. This instance suggests that the *ma*-particle question could have a terminal rise turn-finally.

On the other hand, the same *ma*-particle question may display the falling pitch at the end of a turn.

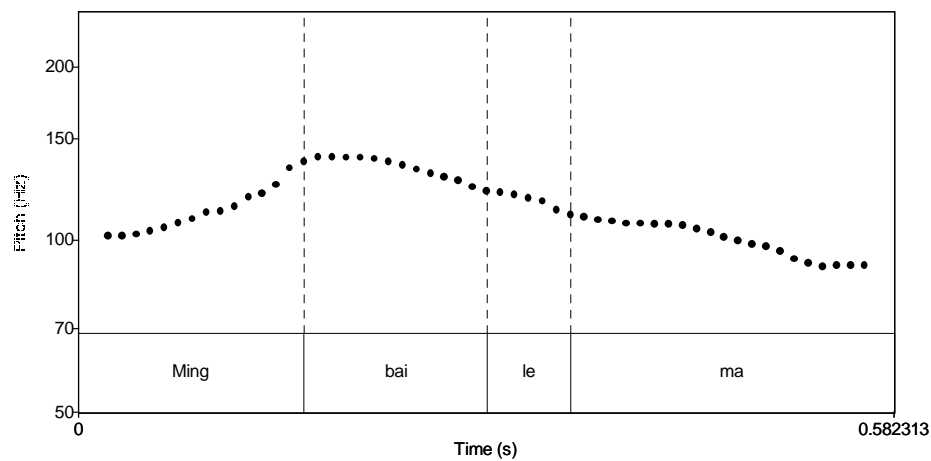
Example 58: 明白了吗 (Turn 63 in Group 3)

(58) 明白 了 吗?

mingbai      le      ma

understand    ASP      QP

“Have you understood (what I have said)?”



Graph 5.58 Turn-final fall in *mingbai le ma*

It can be seen from the frequency analysis in Graph 5.58 that the pitch reaches the highest and starts the falling tendency over the subsequent three toneless syllables of *bai*, *le* and *ma* till the end of the question.

In the data, five instances of ‘明白了吗’ emerge turn-finally. The results show that one out of five has a slight rise at the end of the turn, but four out of five display turn-final falling intonation. On the one hand, it suggests that the same question could have a fall or a rise at the end of the turn. On the other hand, the falling pitch seems to be more frequently deployed turn-finally.

When the same *ma*-particle question emerges in the midst of the turn, the pitch may display a level-rise.

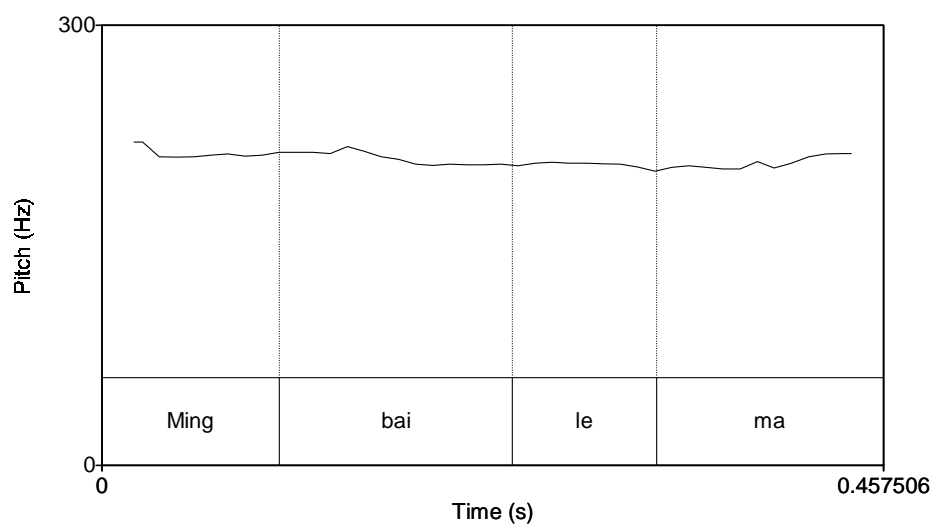
Example 59: 明白了吗 (Turn 65 in Group 2)

(59) 明白 了 吗 ?

mingbai      le      ma

understand ASP QP

“(Do you) see (what mean)?”



Graph 5.59 Non-final level-rise in *mingbai le ma*

The frequency analysis in Graph 5.59 illustrates that the final pitch contour of this question is a slight rise at the end. This instance demonstrates that the same question could display a terminal rise turn-internally in Example 59 and a terminal fall turn-finally in Example 58. It suggests that the pitch movement of the last syllable of the question could not be seen as the only correlate to signal possible turn delimitations in the map-task-type conversation of Mandarin Chinese. That is, the intonation pattern cannot be taken as a very strong predictor for possible turn endings in Mandarin conversation.

It can be concluded that there seems to be no strong connection between a particular pitch contour such as a rise and a level and a turn-internal yes/no question in general. In addition, it also seems that there is no strong link between particular pitch movement such as a fall with a turn-final yes/no question in the map-task-type Mandarin Chinese

conversation. In other words, the pitch movement of the last syllable of the yes/no question might not be the cue enough for turn-continuation or turn-completion. This result is in line with findings about the contribution of the intonational patterns to the projection of turn-completion reported in non-tone languages (e.g., Jefferson 1987; Ford and Thompson 1996; Selting 1996; Szczepiek Reed 2004). It suggests that the cues in connection with turn delimitations might come from a variety of sources like prosodic clusters, syntax, pragmatics or their combination.

## 5.5. Summary

The major findings of this chapter can be summarized as follows.

- 51 per cent of the 137 yes/no questions in the data have a terminal fall, which suggests that falling intonation can be thought of as one of the most important terminal pitch movements for yes/no questions in Mandarin Chinese conversation.
- 22 per cent of the 137 yes/no questions in the data have a terminal level.
- 27 per cent of the 137 yes/no questions in the data have a terminal rise.
- As the yes/no interrogative may have a terminal rise, fall or level at the end of the turn-final question, there may be no strong correlation between a particular pitch contour of the final syllable of the yes/no question and turn delimitations in the map-task conversation of Mandarin Chinese.
- Examination of the 62 *ma*-particle question demonstrates that the underlying tone of the preceding toned syllable of the *ma*-particle question may have a significant effect on the final pitch movement of the yes/no question in some instances; however, the effect



of the underlying tone on the final pitch movement of the yes/no question may reduce to a minimum in some cases.

- Investigation of the 75 'A-not-A' yes/no questions reveals that the underlying tone of the last syllable of the 'A-not-A' question plays a significant role in the final pitch movement of the yes/no question in most cases.

- 82 per cent of the 137 yes/no questions emerge at the end of the turn in the map-task-type conversation. This suggests that syntactic resources might play a vital role in the projection of possible turn delimitations in the map-task-type conversations of Mandarin Chinese.

- The comparison between the turn-final declarative and 'A-not-A' interrogative suggests that there is no manifest distinction between them in terms of their final pitch. The underlying lexical tone of the last syllable plays a significant part in the surface of the final pitch of these utterances.

#### Notes

1. The symbol '★' indicates that the pitch contour of the underlying preceding syllable is not consistent with the final pitch of the *ma*-particle question, or the A-not-A question or the declarative in Table 5.2, 5.3 and 5.4.

## 6. CONCLUSION

This study aimed to broaden an understanding of the extent to which prosody contributes to marking potential transition-relevance places in Mandarin Chinese conversation. I attempted to report on the final pitch movement of the yes/no question and declarative used in the map-task-type conversation of Mandarin Chinese and to explore the extent and effect of the underlying tone on the final pitch of the yes/no question. In the eight map-task –type conversations, a total of the 137 yes/no questions are available. Among them, 62 of them are *ma*-particle questions and 75 are yes/no questions with ‘A-not-A’ frame and in the form of ‘Copula + NEG’.

Overall, an examination of the 137 yes/no questions has revealed that the terminal fall is an important pitch contour for yes/no questions in Mandarin Chinese, accounting for 51 per cent of the total number of the yes/no questions in my data. This contradicts past research, in which a terminal rise is usually associated with interrogative intonation in Mandarin Chinese.

Inspection of the 62 *ma*-particle questions has shown that the pitch movement of the last toneless syllable *ma* may display a terminal rise, fall or level, even though prior research indicates that underlying tone of the preceding accented syllable has a significant effect on the surface pitch movement of the last toneless syllable *ma*.

Additionally, investigation into the 75 ‘A-not-A’ questions suggests that the underlying tone of the last syllable of the yes/no question plays a crucial part in the final pitch movement of the ‘A-not-A’ interrogative ending with toned syllables, even though a

small number of instances show that the final pitch of the interrogative may undergo modifications at ends of turns.

For comparative purposes, examination of the turn-final declarative has demonstrated that the same pitch patterns exist in statements. This suggests that there is no significant difference between the turn-final 'A-not-A' interrogative and declarative in terms of their final pitch, as the underlying tone of the last syllable plays a key role in the final pitch of the utterance. In other words, it seems that the intonational cue alone may play a restricted role in signaling possible turn completions in Mandarin conversation.

Finally, only 25 yes/no questions emerge in the midst of turns, whereas 112 questions are employed at ends of turns. The comparison between the turn-internal and turn-final yes/no questions suggests that there is no strong correlation between the particular pitch movement of the last syllable of the question and potential turn delimitations in the map-task-type conversation. This finding is in line with findings involving the connection between the turn-final intonation and possible turn endings in conversation of English (Szczepek Reed 2004) and German (Selting 1992).

Most past research on the intonation of yes/no questions of Mandarin Chinese suggests that terminal rising intonation is the most important pitch contour and most frequently used in communication. For instance, Cruttenden (1997: 157) reports that it is usual for the yes/no question to have a terminal rise even in tone languages. Shen (1994) describes the typical interrogative intonation in Mandarin Chinese as the top line of  $F_0$  having an abrupt fall and the bottom line of  $F_0$  having a slight rise. However, my examination of the 137 yes/no questions in the map-task-type conversation of Mandarin

Chinese has revealed that 51 per cent of the questions have a terminal fall. On the other hand, 27 per cent of the questions have a terminal rise and 22 per cent end in a terminal level. In other words, the number of the yes/no questions ending with a rise is nearly half of that ending with a fall. In addition, the analysis of my data has shown that the yes/no question may also have the terminal level intonation. I therefore present an entirely new intonational observation in the terminal level contour at the end of yes/no questions in direction-giving interaction.

The results also suggest that there is no strong correlation between a particular intonation pattern and the syntactic structure of the utterance. This finding implies that it might not be appropriate to associate the yes/no question in Mandarin Chinese with a terminal rise. This study shows that the yes/no question may have a terminal rise, fall or level in spontaneous Mandarin Chinese conversation.

Prior research on the effect and extent of the preceding toned syllable on the subsequent toneless syllable suggests that the lexical tone has a powerful effect on the toneless syllable(s) (Yip 2002; Shih 1987). However, my study of 62 *ma*-particle questions has shown that 43 per cent of the questions have a terminal rise, and 39 per cent of the questions have a terminal fall, and 18 per cent of the questions have a terminal level. For instance, when the last toneless syllable of *ma* is adjacent with Tone2, the *ma*-particle question can have a terminal rise, fall or level. To iterate, this suggests that there is no strong correlation between the lexical tone of the preceding toned syllable and the pitch movement of the last toneless syllable of *ma* in the map-task-type conversation of Mandarin Chinese. In some cases, the effect of the preceding toned syllable may be

reduced to a minimum in the direction-giving interaction.

Finally, past research suggests that the lexical tone of the last toned syllable (Tone1, Tone2, Tone3 and Tone4) keeps its original tonal shape at the end of the utterance (Lin 2004). The findings of this study provide some evidence for this perspective. The underlying tone of the last syllable plays a key role in the final pitch of the 'A-not-A' interrogatives ending with toned syllables. More importantly, investigation of the turn-final declarative in my data also suggests that the same pitch patterns exist in the statements ending with toned syllables. This observation suggests that the primary function of pitch in Mandarin Chinese conversation is to differentiate lexical meaning rather than signal potential turn completions when an utterance ends with a toned syllable. In other words, in those cases the role of pitch in projecting potential transition-relevance places might be secondary in Mandarin Chinese.

However, six deviant cases in the data have shown that the lexical tone of the last toned syllable might undergo modifications at ends of turns. To illustrate, when the last syllable is Tone1 (55, high level) at the end of the yes/no question, the pitch movement of the last syllable may have a terminal rise, fall or level. This suggests that the lexical tone of the last toned syllable does not always play a deterministic role in the surface of the final pitch movement of the yes/no question. Once again, the same pattern exists in the turn-final declarative.

There are some limitations to this study. To illustrate, a relative small data set does not allow me to generate too broadly the observations made in the course of this study. There are some unsolved issues as to whether syntactic resources are eventually more

---

important than prosodic ones in projecting turn-finality in Mandarin Chinese conversation. More evidence is needed to find out whether these findings apply also to the context of ordinary Mandarin Chinese conversation.

Another limitation of this study is that most of the participants come from Hunan Province and Hunan dialect may have some impact on their production of the neutral tone in disyllabic compounds. This may affect the findings regarding the prosody of interrogatives in Mandarin Chinese conversation to some extent. I am not unaware of the effect of Hunan dialects on findings concerning Mandarin Chinese. However, this small-scale study may contribute to a tentative understanding of the role of prosody in conversation and the effect of underlying tone on the final pitch of the yes/no interrogative produced by participants themselves who have Hunan dialects.

## APPENDICES

### I. Transcription notations

- i. In the transcripts, the first line in italics is the original Mandarin utterance in Chinese characters; the second line is *pinyin* in Mandarin Chinese; the third lined is a word-for-word gloss; and the fourth line is a vernacular English gloss.
- ii. Boxes are used to draw attention to phenomena; endings of relevant turns are highlighted in bold.

### II. Abbreviations in the transcripts

ASP	aspect
CLS	classifier
COP	copula
FP	final particle
NEG	negative
PT	particle ( <i>de</i> )
QP	question particle
SFP	sentence final particle
2SG	second person singular

**REFERENCES**

- Anderson, A. H., Bader, M., Gurman Bard, E., Boyle, E., Doherty, G., Garrod, S., Kowtko, J., McAllister, J., Miller, J., Sotillo, C., & Thompson, H. S. (1991). "The HCRC map task corpus." *Language and Speech* 34: 351-366.
- Anne, A. & Lawrence, M. D. (2004). *Voice Feminization Survey: A Critical Review*. From <http://www.annelawrence.com/voicesurgery.html>
- Bao, Z. M. (2003). "Book Review Moira Yip (2002). *Tone*. (Cambridge Textbooks in Linguistics) Cambridge University Press. Pp. xxxiv+341." *Phonology* 20: 275-279. Cambridge: Cambridge University Press.
- Beckman, M. & Pierrehumbert, J. (1986). "Intonation structure in Japanese and English." *Phonology Yearbook* 3: 255-309.
- Boersma, P & Weenink, D. (2006). "Praat: doing phonetics by computer." Downloaded on 15 August 2006 from <http://www.fon.hum.uva.nl/praat/>
- Cao, J. F. (1986). "Analysis of neutral-tone syllables in Standard Chinese." *Applied Acoustics* 5(4): 1-6.
- Caspers, J. (2003). "Local speech melody as a limiting factor in the turn-taking system in Dutch". *Journal of Phonetics* 31: 251-276.
- Chafe, W. (1980). "The deployment of consciousness in the production of a narrative." In W. Chafe (Ed.), *The Pear Stories: Cognitive, Cultural and Linguistic Aspects of Narrative Production*. (pp. 9-50). Norwood, NJ: Ablex.
- Chao, Y. R. (1932). "A preliminary study of English intonation (with its American variants) and its Chinese equivalent." *Journal of the Institute of History and*



- Language of Central Academy Supplement*) S: 105-156.
- Chao, Y. R. (1933). "Tone and intonation in Chinese." *Bulletin of the Institute of History and Philology, Academia Sinica*. 3: 121-134.
- Chao, Y. R. (1968). *A Grammar of Spoken Chinese*. Berkeley and Los Angeles: University of California Press.
- Chu, C. C. (1998). *A Discourse Grammar of Mandarin Chinese*. New York: Peter Lang Publishing.
- Chuang, C. K. (1972). *An Acoustic Study on the Chinese Four Tones*. Unpublished Ph.D. dissertation [in Japanese], Tohoku University, Sendai, Japan [abstract in English].
- Condon, W. S., & Ogston, W. D. (1967). "A segmentation of behavior." *Journal of Psychiatric Research* 5: 221-235.
- Cook, G. (1989) *Discourse*. Oxford: Oxford University Press.
- Couper-kuhlen, E. (1986). *An Introduction to English Prosody*. London: Edward Arnold.
- Couper-Kuhlen, E. (1993). *English Speech Rhythm: Form and Function in Everyday Verbal Interaction*. Amsterdam and Philadelphia: Benjamins.
- Couper-Kuhlen, E. and Selting, M. (1996). *Prosody in Conversation*. Cambridge: Cambridge University Press.
- Couper-Kuhlen, E. (2001). "Interactional prosody: High onsets in reason-for-the-call turns." *Language in Society* 30: 29-53.
- Coulthard, M. (1985). *An Introduction to Discourse Analysis*. Second edition. Harlow: Longman.
- Cruttenden, A. (1997). *Intonation*. Cambridge: Cambridge University Press.

- Crystal, D. (1969). *Prosodic Systems and Intonation in English*. Cambridge: Cambridge University Press.
- De Francis, J. F. (1963). *Beginning Chinese*. New Haven: Yale University Press.
- D'Imperio, M. & House, D. (1997). "Perception of questions and statements." In Neapolitan Italian *Proceedings of Eurospeech 97*, (pp. 251-254). Rhodes, Greece.
- Du Bois, J. W., Schuetze-Coburn, S., Cumming, S., & Paolino, D. (1993). "Outline of discourse transcription." In J. A. Edwards & M. D. Lampert (Eds.), *Talking Data: Transcription and Coding in Discourse Research*. (pp. 45-89). London: Lawrence Erlbaum.
- Duncan, S. Jr. (1972). "Some signals and rules for taking speaking turns in conversations." *Journal of Personality and Social Psychology* 23(2): 283-292.
- Dutoit, T. (1997). *An Introduction to Text-to-speech Synthesis*. Dordrecht Kluwer: Academic Publishers.
- Firth, J. R. (1957). "A synopsis of linguistic theory. 1930-1955." *Studies in Linguistic Analysis*. Special Volume, Philological Society. Oxford: Blackwell.
- Ford, C. & Thompson, S. (1996). "Interactional units in conversation: syntactic, intonational, and pragmatic resources for the management of turns." In Ochs, E. Schegloff, E. & Thompson S. (Eds.), *Interaction and Grammar*. (pp. 134-184). Cambridge: Cambridge University Press.
- French, P. & Local, J. (1983). "Turn competitive incomings". *Journal of Pragmatics* 7: 17-38.
- Gärding E. (1979). "Sentence intonation in Swedish." *Phonetica* 36: 207-215.
- Gósy, M. & J. Terken (1994). "Question marking in Hungarian: timing and height of

- pitch peaks." *Journal of Phonetics* 22: 269-281.
- Hann, J. (2001). *Speaking of Questions: An Exploration of Dutch Question Intonation*.  
Dissertation. Netherlands Graduate School of Linguistics (LOT).
- Hirst, D.J. & Di Cristo, A. (1998). "A survey of intonation systems." In Hirst & Di  
Cristo. (Eds.) *Intonation Systems: A Survey of Twenty Languages*. (pp.1-44).  
Cambridge: Cambridge University Press.
- Ho, A. (1977). "Intonation variations in a Mandarin sentence for three expressions:  
interrogative, exclamatory, and declarative." *Phonetica* 34: 446-456.
- Hubbard, K. (1994). *Duration in Moraic Theory*. Ph.D. dissertation. Berkeley: University  
of California.
- Jefferson, G. (1987). "Notes on 'latency' in overlap onset." In G. Button, P. Drew, & J.  
Heritage (Eds.), *Interaction and language use*. Special issue of *Human Studies* 9:  
153-183.
- Jin, S. (1992). "Mood and intonation in Beijing dialect." *Zhongguo Yüwen* 2: 113-123 (in  
Chinese).
- Labov, W. (1972). *Sociolinguistic Patterns*. Philadelphia: University of Pennsylvania  
Press.
- Ladd, D. R. (1983). "Phonological features of intonational peaks." *Language* 59:  
721-759.
- Ladd, D. R. (1996). *Intonational Phonology*. Cambridge studies in linguistics 79.  
Cambridge: Cambridge University Press.
- Levis, J. M. (1999). "The intonation and meaning of normal yes/no questions." *World*

*Englishes* 18/3: 373-380.

- Li, C. J. (1998). *Tag Questions in Mandarin Chinese*. National Cheng-chi University M.A. Thesis. Taipei.
- Li, C. N. & Thompson, S. A. (1981). *Mandarin Chinese: A Functional Reference Grammar*. Los Angeles: University of California Press.
- Liberman, M. (1975). *The Intonational System of English*. Doctoral dissertation. MIT. Cambridge, Mass.
- Lin, M. C. (2004). "Chinese intonation and tone". *Applied Linguistics* 3: 57-67.
- Lin, T. (1982). "Experimental approach to neutral-tone syllables in Standard Chinese." *Collections of Linguistic Papers*, Vol. 10: 16-37.
- Liu, X. (2001). *Shiyong Hanyu Keben "Practical Chinese Reader"* Beijing: Commercial Press.
- Liu, X. Z. & Song, X. Q. (2004). "A list of neutral tone in compounds for *Putonghua* proficiency test." [in Chinese] In Yao, X-S. & Liu, Z-X. (Eds.) *Implementation Outline for Putonghua Proficiency Test*. (pp. 247-252). Beijing: Commercial Press.
- Local, J. & Kelly, J (1986). "Towards a phonology of conversation: turn-taking in Tyneside English". *Journal of Linguistics* 22: 411-437
- Ogden, R. (2001). "Turn-holding, turn-yielding and laryngeal activity in Finnish talk-in-interaction". *Journal of the International Phonetics Association* 31: 139-152.
- Ogden, R. (2002). "Creak voice and turn-taking in Finnish." *BAAP Newcastle*. March 25-27.
- Ogden, R. (2004). "Non-modal voice quality and turn-taking in Finnish." In

- Couper-Kuhlen, E. & Cecilia E. F. (Eds). *Sound Patterns in Interaction: Cross-linguistic Studies from Conversation*. (pp. 29-62). Amsterdam/Philadelphia: Benjamins.
- Orestrom, B. (1983). *Turn-taking in English Conversation*. Lund: GWK Gleerup.
- Pierrehumbert, J. (1980). *The Phonology and Phonetics of English Intonation*. Ph.D. dissertation, MIT.
- Pierrehumbert, J. and Beckman, M. E. (1988). *Japanese Tone Structure*. MIT Press
- Quirk, R. (1975). *Indirect Speech Acts*. New York: Academic Press.
- Roach, P. (1991). *English Phonetics and Phonology*. Cambridge: Cambridge University Press.
- Sacks, H., Schegloff, E. & Jefferson, G. (1974). "A simplest systematics for the organization of turn-taking for conversation." *Language* 50: 696-735.
- Schaffer, D. (1983). "The role of intonation as a cue to turn taking in conversation." *Journal of Phonetics* 11: 243-257.
- Schegloff, E. A. & Harvey Sacks. (1973). "Opening up closings." *Semiotica* 7: 289-327.
- Schegloff, E. A. (1995). "Discourse as an interactional achievement III: The omnirelevance of action." *Research on Language and Social Interaction* 28(3).
- Schegloff, E. A. (1996). "Turn organization: one interaction of grammar and interaction". In: OCHS, E., Schegloff, E. A. & Thompson, S. A. (Eds.) *Interaction and Grammar: Studies in Interactional Sociolinguistics* 13. (pp. 52-133). Cambridge: Cambridge University Press.
- Selting, M. (1992). "Prosody in conversational questions". *Journal of Pragmatics* 17:

315-345.

Selting, M. (1995). *Prosodie im Gespräche*. Tübingen: Niemeyer.

Selting, M. (1996). "On the interplay of syntax and prosody in the constitution of turn-constructive units and turns in conversation." In Ford, C. & Wagner, J. (Eds.), *Special Issue: Interaction-based Studies of Language. Pragmatics* 6(3): 371-388.

Selting, M. (1998). "TCUs and TRPs: The construction of units in conversational talk." *Konstanzer Online-Publikations-System*, URL.

Selting, M. (2000). "The construction of units in conversational talk." *Language in Society* 29: 477-517.

Selting, M. (2005). "Syntax and prosody as methods for the construction and identification of turn-constructive units in conversation". In Hakalinen, A. & Selting, M. (Eds.), *Syntax and Lexis in Conversation: Studies on the Use of Linguistic Resources in Talk-in-interaction* (pp.17-44). Amsterdam/Philadelphia: Benjamins.

Shen, J. (1994). *Hanyu yudiao gouzao he yudiao leixing* "Intonation structure and intonation types of Chinese". *Fangyan* 3: 221-228 (in Chinese).

Shen, X. N. (1990). *The Prosody of Mandarin Chinese*. Berkeley: University of California Press.

Shih, C. L. (1987). "The phonetics of the Chinese tonal system." *AT & T Bell Laboratories Technical Memorandum*. MH 11225.

Szczepek Reed, B. (2004). "Turn-final intonation in English." In Couper-Kuhlen, E. &

- Ford, C. E. (Eds) *Sound Patterns in Interaction: Cross-linguistic Studies from Conversation*. (pp. 97-118). Amsterdam/Philadelphia: Benjamins.
- Tanaka, H. (1999). *Turn-taking in Japanese Conversation: A Study in Grammar and Interaction*. Amsterdam: John Benjamins.
- Tanaka, H. (2004). "Prosody for marking transition-relevance places in Japanese conversation: The case of turn unmarked by utterance-final objects." In Couper-Kuhlen, E. & Cecilia E. F. (Eds) *Sound Patterns in Interaction: Cross-linguistic Studies from Conversation*. (pp. 63-95). Amsterdam/Philadelphia: Benjamins.
- Tang, T. C. (1981). "Interrogatives in Mandarin Chinese." *Bulletin of National Normal University* 26: 219-77.
- Thompson, S. (1995). "Teaching intonation on questions." *ELT Journal* 49: 235-243.
- Tseng, S. C. (2001). "Highlighting utterances in Chinese spoken discourse". *Language, Information and Computation ACLIC* 15: 163-174.
- Wichmann, A. (2000). *Intonation in Text and Discourse: Beginnings, Middles and Ends*. London: Longman.
- Yip, M. (2002). *Tone* Cambridge: Cambridge University Press.
- Yuan, J., Shih, C. & Kochanski, G. P. (2002). "Comparison of declarative and interrogative intonation in Chinese". *Proceedings of Speech Prosody*. Aix-en-Provence, France: 711-714.
- Zuraidah, M. D. & Knowles, G. (2006). "Prosody and turn-taking in Malay broadcast interviews." *Journal of Pragmatics* 38: 490-512.