THE PROSODY OF QUESTIONS IN BEIJING MANDARIN

DISSertation

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ABSTRACT

This dissertation examines the pitch patterns of questions in Beijing Mandarin. The conventional view is that since pitch is used to distinguish lexical tones, Mandarin must not cue questions via pitch manipulations. However, this study finds both global and localized F0 cues that depend on pragmatics and focus structures, as well as on syntax.

Pitch range plays an important role in both global and localized F0 cues in syntactically-unmarked questions and syntactically-marked *ma*-particle questions. With respect to the pragmatics of questions, Echo-questions which express such pragmatic meanings as surprise or incredulity are associated with a globally expanded pitch range and a raised top line in both syntactic types of questions. While the global expansion of pitch range is performed to a smaller degree in InfoSeek-questions, the expansion of pitch range is more localized over the last noun phrase, which often functions as the question focus in yes-no questions.

The intonational manipulations in interaction with the pragmatics of questions found in this study refute earlier claims that prosodic cues are important only in the absence of a syntactic cue or that a certain intonation pattern is consistently produced in association with a syntactically-based question type. Nonetheless, syntax contributes to the formation of the intonation patterns of
questions, such that when syntactically-unmarked and marked yes-no questions are uttered to express comparable pragmatic meanings, both global and localized F0 cues are exaggerated when no syntactic cues are available.

The intonational patterns of questions also interact with stress. In question-word questions, the question-word is inherently focused. As for question intonation and sentential stress, the expansion of pitch range associated with pragmatic narrow focus is realized to a greater extent in questions. The compression of pitch range, following narrow focus, is not realized as much in questions due to the expansion of pitch range employed to signal the question. Therefore, the lexical tones and the terminal rise are identifiable in post-focal position.
To Dong Wook Lee
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CHAPTER 1

INTRODUCTION

The present study examines question prosody in Beijing Mandarin, the variety of Mandarin on which Standard Chinese (Mandarin, Putonghua) is based. The larger context for this study is an often repeated claim that question prosody is universal, i.e., that all languages use high pitch or rising pitch to cue questions. This observation, associated with such researchers as Hermann (1942), Bolinger (1978), and Lindsey (1985), has been attributed by Ohala (1983, 1984) to a universal ethological grounding in the relationship between pitch and body size, which he terms the "Frequency Code". While the ethological basis is controversial, the observation itself seems fairly robust. (See a recent review in Chen 2005.) Other things being equal, questions do seem to have some kind of high or rising pitch relative to declarative statements, and Mandarin Chinese is no exception, as suggested by Chao (1933) and many others.

At the same time, Beijing Mandarin is an interesting test case for the claim because it is widely acknowledged that the precise phonetic realization of the "universal" high or rising pitch differs across languages in ways that might depend on such other language-specific features as stress, accent, and tone. In that context, Beijing Mandarin is interesting in two ways. First, Beijing Mandarin, like other varieties of Mandarin, has lexical tone. That is, pitch is used to contrast the four phonemically-distinct lexical tones in the language. Second, Beijing Mandarin
distinguishes itself from some other varieties of Mandarin by having lexical stress. Hence, a thorough examination of the language helps us understand not only how question prosody interacts with lexical tones but also how question prosody and tone together interact with stress.

Studying question prosody in Mandarin provides a useful means to explore prosodic phenomena realized at different phonological levels. First, the intonational manipulations performed to signal that an utterance is a question may include both more global cues such as expanded overall pitch range and cues primarily localized to the edge of an utterance. Moreover, both global and local cues may interact with prosodic elements that function at lower levels than the utterance as a whole, such as lexically-specified tones and stress at the word or phrase level. Hence, a careful examination of prosodic implementations in questions will enable us to achieve a better picture of the prosodic structure of Mandarin.

Nonetheless, sentence-level prosody still remains one of the least explored topics in Chinese linguistics. Despite the lack of work done on this topic, an early and still widely-held view is that the sentence-level prosody of Mandarin must be constrained due to the fixed use of pitch for lexical tones (Chao 1933, 1968; Fry 1968; Wu 1982; Connell et al. 1983, among others). In this view, the intonational patterns in Mandarin are largely predictable based on lexical tones and tone sandhi rules. According to Wu (1982), for example, although such factors as syntactic structure, focus, type of sentence, and speech rate influence intonation, they must not alter basic tonal patterns.

Another language-specific feature that is cited as support for this view is the prevalent use of sentence-final particles. Among the sentence-final particles used in Mandarin, Li and Thompson (1981: 238) describe the characteristic pragmatic functions of the six most frequently used sentence-final particles in Mandarin: *le* 'currently relevant state', *ne* 'response to expectation',
ba 'solicit agreement', ou 'friendly warning', a/ya 'reduce forcefulness', and ma 'question'. The same kind of functions have been attributed to common or stereotypical intonation contours in languages such as English (see a review in Ladd 1980, for example). Given the similarities between typical intonational functions and the functions of particles, Chao (1933) concluded that many of the intonational functions in non-tone languages are fulfilled instead by the use of particles in Mandarin.

However, an increasing number of recent experimental studies have found that these two language-specific features do not necessarily preclude the use of sentence-level prosody in Mandarin. In fact, sentence-level prosody not only varies with respect to the syntax of an utterance (see Shen, J. 1985, Shen, X.N. 1990, Lee 2000, 2005, Yuan 2004, etc.) but also functions as a reliable cue to signal the information focus of an utterance (Yang, L.M. 1993, 1994, Jin, S.D. 1996, Lee 2005, Peng et al. 2005, etc.).

In these studies, a good deal of attention has been paid to the prosodic differences between statements and questions. Studies that deal with such differences include Jin (1992), Shi (1980), Shen, J. (1985, 1994), Gårding (1987), Shen, X.N. (1990), Yang, L.M. (1995), Lee (2000, 2005), Wu (1982), Yuan et al. (2002), and Yuan (2004). (They will be reviewed in more detail in Chapter 3.) However, a close look at the hypotheses that guide these studies reveals a common methodological flaw. Specifically, since it has been widely presumed that prosodic cues are used only in the absence of syntactic cues, a fairly common practice has been to characterize question prosody or question intonation (yíwèn yūdìào, 疑問語調) solely based on the acoustic properties of syntactically-unmarked echo-questions. This is true of Hu (1985), Wu (1982), Jin (1992), and Yuan et al. (2002).
Another methodological flaw found in many earlier studies of question prosody in Mandarin is identify an utterance as a question only based on its syntactic form.\(^1\) Therefore, an utterance in interrogative form is often equated with a question. However, mismatches between formal syntactic properties and pragmatic functions can be often found. As illustrated in the utterance, "Can you pass me the salt?" uttered at the dinner table, an interrogative sentence is not necessarily a question. Furthermore, what is inquired about by a question also varies depending on the context, and the pragmatic meanings and presuppositions of a question are expressed by means of prosodic manipulations (Lee 2000).

Recognizing that the functions of a question are determined not only by syntax but also by its relationship with the larger discourse context leads us to realize that the prosodic pattern produced on any question must be the result of prosodic manipulations at several different linguistic levels. This means that we need to carefully distinguish among different types of constraints that contribute to the overall prosodic pattern of a question. We cannot hope to find simple one-to-one correspondences between prosodic patterns and syntactic forms of questions. By exploring prosodic variation with regard to the syntax of questions, we can evaluate the prevailing claim that prosodic cues are redundant or secondary to syntactic cues in Mandarin. At the same time, an investigation of the realization of prosodic cues in different pragmatic contexts also helps us to understand the role of prosody in discourse contexts.

The present study attempts to provide an integrated account of question prosody in Mandarin. Three aspects of question utterances — tonal effects, syntactic structures, and pragmatic functions determined in larger discourse contexts — are carefully examined to understand how different linguistic factors contribute to the prosodic patterns of questions. Specifically, this study employs a large set of data that are deliberately controlled with respect to

\(^1\) See, for instance, Li and Thompson 1981 (pp.520-548) for a categorization of questions in Mandarin.
these three linguistic components to identify different motivations for prosodic manipulations in questions (e.g., cueing the question and expressing pragmatic meanings such as surprise and incredulity) and, therefore, to find what can be treated as prosodic features essential to signaling a question. This will enable us to achieve a better understanding of the interface between prosody and syntax/pragmatics in questions in Mandarin.

More specifically, the present study aims to explore six types of questions in comparison with their corresponding statements in Beijing Mandarin. They are Information-Seeking and Echo syntactically-unmarked yes-no questions, Information-Seeking and Echo ma-particle questions (i.e., syntactically-marked yes-no questions), and Information-Seeking and Echo question-word questions, all of which are derived from the same statement. The categorization of the question types, with an example set of utterances, is presented in Table 1.1:

They treat "questions" and "interrogatives" as interchangeable.
### Utterance Types Example Utterances

<table>
<thead>
<tr>
<th>Utterance Types</th>
<th>Example Utterances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Statement</td>
<td>Tā qù yīyuàn. 他去醫院. (he go hospital) &quot;He is going to the hospital.&quot;</td>
</tr>
<tr>
<td>2. Syntactically-Unmarked Yes-No Question</td>
<td>Tā qù yīyuàn? 他去醫院. (he go hospital) &quot;He is going to the hospital?&quot;</td>
</tr>
<tr>
<td>2.a. Information-Seeking Question</td>
<td></td>
</tr>
<tr>
<td>2.b. Echo-Question</td>
<td></td>
</tr>
<tr>
<td>3. Ma-Particle Yes-No Question</td>
<td>Tā qù yīyuàn ma? 他去醫院嗎? (he go hospital question particle) &quot;Is he going to the hospital?&quot;</td>
</tr>
<tr>
<td>3.a. Information-Seeking Question</td>
<td></td>
</tr>
<tr>
<td>3.b. Echo-Question</td>
<td></td>
</tr>
<tr>
<td>4. Question-Word Question</td>
<td>Tā qù nàr? 他去哪兒? (he go where) &quot;Where is he going?&quot;</td>
</tr>
<tr>
<td>4.a. Information-Seeking Question</td>
<td></td>
</tr>
<tr>
<td>4.b. Echo-Question</td>
<td></td>
</tr>
</tbody>
</table>

Table 1.1. Question Types Examined in the Study

These six types of questions are first categorized on a syntactic basis. The two types of yes-no interrogatives are distinguished from each other in so that one is syntactically-unmarked and the other is syntactically-marked. They are the primary interrogative types to be explored in this study since they are not only prevalent in the language but also segmentally identical to the corresponding statement (except for the presence of the *ma*-particle in the case of *ma*-particle question). Hence, they provide an ideal pair to for the observation of question intonation patterns in comparison with corresponding statement intonation patterns. Question-word questions,
another type of syntactically-marked question, are also examined to understand the interface between syntax and question prosody, as well as the focus structure in questions. (See section 4.2 for a detailed discussion of the experimental materials.)

Note that each interrogative type is further subdivided into two question types according to their pragmatic functions: information-seeking questions and echo-questions. Here, an echo-question refers to a reiterative question uttered to achieve a joint commitment from the listener. It asks whether the questioner heard the statement correctly, or it can express a speaker's incredulity or surprise (Gunlogson 2001: 126). This pragmatic distinction is made so that we can observe how different pragmatic functions influence question prosody.

The present study elicited target utterances of these six question types by embedding them in dialogues that native speakers of Beijing Mandarin performed in pairs. The data set thus consists of recorded utterances produced by multiple speakers so that prosodic patterns can be analyzed by computer. The phonetic representation that will be used is the calculated fundamental frequency (F0) contour, a physical measure that correlates with the psychological percept of pitch.

The main research questions for the present study can be summarized in the following five broad groups:

First, are certain intonational properties consistently and systematically used to signal questions as opposed to statements? If so, what types of prosodic cues are used (e.g., terminal rise, global rising trend, high pitch onset, and focus related pitch range expansion) and how do they interact with each other?
Second, are there any correspondences between syntactic structures and intonational manipulations? More specifically, are syntactic cues (the ma-particle, a question-word) used to the exclusion of prosodic manipulations in Mandarin? Or would intonational cues become more consistent or more salient in the absence of syntactic cues?

Third, if intonation is manipulated in syntactically-marked questions (i.e., ma-particle questions, and question-word questions), how are intonational patterns of syntactically-marked questions distinguished from those of syntactically-unmarked questions as well as from those of statements?

Fourth, would the pragmatics of questions correlate with intonation patterns? If so, how are information-seeking questions prosodically distinguished from echo-questions, and how are prosodic correlations of pragmatics realized in relation to the syntax of questions?

Fifth, how does focus structure (broad focus vs. pragmatic narrow focus) interact with question intonation patterns? Is narrow focus realized differently in questions than in statements?

The rest of the chapters of this study will be organized as follows: in Chapter Two, the primary components of Mandarin prosody – lexical tones, stress, and higher-level prosodic phenomena – and major question types in Mandarin are introduced. Chapter Two therefore provides background information on the prosody and question types in Mandarin that facilitates the discussion in later chapters. Chapter Three reviews and discusses existing hypotheses on question prosody in Mandarin. Chapter Four introduces the data, experiment, and methodology of this study. Chapters Five through Seven present the findings of this study. Specifically, Chapter Five addresses the global intonation patterns of yes-no questions with reference to the pragmatics of questions, and Chapter Six discusses the localized pitch rise and its domain in yes-no
questions, and further demonstrates how localized F0 manipulations interact with more global intonational patterns. Chapter Seven discusses the interface between stress and question prosody. Chapter Eight summarizes the study with a general discussion and conclusion.
CHAPTER 2

BACKGROUND: MANDARIN PROSODY AND QUESTIONS IN MANDARIN

This chapter provides background information on Mandarin prosody and question types in Mandarin. First, it discusses the primary components of the prosody of Beijing Mandarin — namely, tones, stress, focal prominence markers, and pitch range manipulations at a higher level — and illustrates important prosodic characteristics of the language using example utterances from the data recorded for this study. The latter half of the chapter introduces question types in Mandarin. This chapter therefore serves as an introduction to the phenomena that organize the discussion of the experimental results presented in later chapters (Chapters 5 through 7).

2.1 Mandarin Prosody

2.1.1 Lexical Tones

Lexically-Specified Tones

It is a well-known fact that Mandarin is a lexical tone language. It has four phonemically-contrasting lexical tones, which are often referred to as Tone 1 through Tone 4. Chao's five-level numerical scale has been widely adopted for the notation of the four lexical tone types (Chao
1930, 1933, 1968). In this scale, with "1" being the lowest pitch value and "5" being the highest pitch value within a speaker's pitch range, Tone 1 through Tone 4 are represented as "55", "35", "214", and "51", respectively. The Pinyin system (i.e., the official romanization system in the People's Republic of China) marks the tones using iconic diacritics above the letters, as in ā, á, ě, and à. The shapes of the tonal contours and the notations of the corresponding pitch values are summarized in Table 2.1.

<table>
<thead>
<tr>
<th>Tone</th>
<th>Tone Shape</th>
<th>Pitch Value in Chao's Scale</th>
<th>Tone Targets</th>
<th>Tone Diacritics in Pinyin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tone 1</td>
<td>High-level</td>
<td>55</td>
<td>H</td>
<td>ā</td>
</tr>
<tr>
<td>Tone 2</td>
<td>High-rising</td>
<td>35</td>
<td>LH</td>
<td>á</td>
</tr>
<tr>
<td>Tone 3</td>
<td>Low-dipping</td>
<td>214</td>
<td>L(H)</td>
<td>ě</td>
</tr>
<tr>
<td>Tone 4</td>
<td>High-falling</td>
<td>51</td>
<td>HL</td>
<td>à</td>
</tr>
</tbody>
</table>

Table 2.1. Pitch Contours and Notations of Lexical Tones in Mandarin

The tonal targets of Tone 1 through Tone 4 are labelled as H, LH, L(H), and HL, respectively, in this study. The high tone target of Tone 3 is labelled as (H) since it is distinguished from that of the other three tone types in two ways. First, the high tone target of Tone 3 is not realized as high as that of Tone 1, Tone 2, or Tone 4. Therefore, the former is transcribed as "4", whereas the latter is transcribed as "5" in Chao's scale. At the same time, the high tone target is realized only at the final position of the major prosodic unit. The surface F0 contours of Tone 3 are described in more detail in the following section.

**Tone 3 and Tone Sandhi**

Among the four lexical tones, Tone 3 is known to be realized in three different surface F0 contours according to its adjacent tone and its position within a prosodic unit. On the one hand, it
becomes Tone 2 when it precedes another Tone 3 with no prosodic break between the two syllables. For instance, the word zǒngtóng "president" is pronounced as zǒngtóng. On the other hand, when Tone 3 immediately precedes Tone 1, Tone 2, or Tone 4, it is realized as a low-falling tone ("21"). The low-dipping shape, which is transcribed as "214" and which the pinyin diacritic stylizes, is seen only at the final position of a major prosodic unit (e.g., intonational phrase). However, as illustrated in Figure 2.1, Tone 3 can be realized as a low-falling tone (i.e., "21") even at utterance-final position. This figure shows the fundamental frequency (F0 contour) for an utterance of the statement Tā xǐhuān chí huāshēngmǐ "S/he likes to eat peanuts" produced by a male speaker of Beijing Mandarin. As indicated by the arrow in the figure, the utterance-final Tone 3 syllable mǐ is realized as a low-falling tone with no rising contour following. This is particularly common in Beijing Mandarin. (See Chapter 6 for a discussion of the tonal contours of Tone 3 at utterance-final position in statements and yes-no questions.)

Figure 2.1. Tone 3 at Utterance-Final Position: Statement Tā xǐhuān chí huāshēngmǐ "S/he likes to eat peanuts."
Chao describes the tonal variation for Tone 3 in terms of tone sandhi changes from the base for the "214" contour (1968: 27-8). According to him, another type of tone sandhi is the change of Tone 2 to Tone 1 in a trisyllabic sequence. If the first syllable in a trisyllabic word or phrase is Tone 1 or Tone 2, and the last syllable is any tone except neutral tone, then Tone 2 on the second syllable tends to change into Tone 1. For instance, the tones of the word hánshúbiāo "thermometer" tend to be pronounced as hánshúbiăo. These alternations might be called "allophonic" tone sandhi, since they seem to be conditioned entirely by the tonal environment in conjunction with the prosodic phrasing.

There is also morphophonemic tone change for a small number of words, such as numerals yī "one", qī "seven", and bā "eight", and the negation morpheme bù ‘not’. For example, yī is pronounced as yì when it is immediately followed by Tone 1, Tone 2, or Tone 3 (e.g., yìlóu "first floor"). However, it is pronounced as yí when Tone 4 immediately follows it (e.g., yìwàn "ten thousand").

Neutral Tone

Some particles (e.g., the perfective aspect particle le attached to a verb as in kànle "have/has seen") and bound morphemes (e.g., the nominal suffix zi in zhuōzi "table") in Mandarin are inherently unspecified for tone and therefore in "neutral tone". Chao (1968) considers the phonetic value of neutral tone to be predictable from that of its preceding full tone. In his classic representation, neutral tone is transcribed as half-low ("2" in his numerical scale) after Tone 1, middle ("3") after Tone 2, half-high ("4") after Tone 3, and low ("1") after Tone 4 (1969: 36). Although several different accounts have been put forth since Chao (e.g., tonal spreading from the preceding syllable, interpolation between the preceding and following lexical tones,
interpolation between the preceding lexical tone and the boundary tone, and pitch target approximation; see Yip 1980; Shih 1987, Wang 1997; Li 2003; Chen and Xu 2002, etc.), it has been largely agreed that the surface pitch value of a syllable with neutral tone is heavily influenced by its neighboring lexical tones. Neutral-toned syllables also show segmental lenition, such as shorter duration and frequent devoicing of the vowel (Chao 1968: 37, Peng et al. 2005). (See Chapter 6 for a discussion of the F0 patterns on neutral-toned syllables in yes-no questions.)

2.1.2 Stress

Word / Phrase Level Stress

One of the important prosodic features of Mandarin is stress. Stress specified at the lexical level is defined by the contrast between full-toned morphemes and inherently neutral-toned morphemes: inherently neutral-toned syllables lack stress. There are also positioning effects to affect the stress of toned syllables. In particular, it is very common for the second syllable in a lexicalized disyllabic word to become unstressed or "neutralized" in Beijing Mandarin (Chao 1969: 38-39, Wang 2003). Therefore, the occurrence of a neutral-toned syllable can distinguish a lexicalized word from a decomposable compound, as in the monomorphemic dōngxi "thing" versus the compound dōngxī "east-west" (Peng et al. 2005).

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2 See Peng et al. (2005) for a discussion of variable phonetic patterns of neutral tone across varieties of Mandarin (e.g., Guoyu vs. Rugaohua).

3 Some studies claim that northern varieties of Mandarin, such as Beijing Mandarin, have a contrast between iambic and trochaic stress patterns in full-toned disyllabic words. For instance, according to Yin (1982), the pair sǎnbù "to spread" and sānbù "to take a walk" have the same segmental and tonal sequence, but the meanings are distinguished by the position of stronger stress. (Stronger stress is placed on the underlined syllable of the word.)
In Figure 2.2, both disyllabic words (i.e., zhōngguó "China" and hélán "the Netherlands") have weakened stress on the second syllable. Therefore, as indicated by the arrows in the figure, the lexically-designated tone (Tone 2) becomes "neutralized".

Figure 2.2. Stress at the Word-Level in Beijing Mandarin: Statement Zhōngguó děi yíng hélán "China must beat the Netherlands."

Notice that the F0 on the syllable guó is not rising but is rather a transition between the preceding high tone zhōng and the following low tone děi. Likewise, the tone of the syllable lán is completely neutralized. Stress differences become evident when comparing the F0 contour on these two syllables and the rising contour on the other Tone 2 syllables, yíng and hé.

Weakened stress, and therefore neutralized tone, commonly occurs at the non-initial position of a phrase in Beijing Mandarin. According to Chao (1968: 35), degrees of stress are predictable by the position in a phrase or a compound word: strong stress falls on the last syllable,
and the syllable in the intermediate position becomes least stressed. Figure 2.3 shows weakened stress across the two syllables shíhòu "when" in the statement, Lì Líng xiǎo de shíhòu àì hē niúnài. "Li Ling liked drinking milk when she was little."

As highlighted by the circle in the figure, due to weakened stress over the two syllables shíhòu "when", along with its preceding neutral-toned syllable de (nominal particle), the pitch contour realized over the three syllables de shíhòu becomes a mere interpolation between the neighboring two stressed syllables - low toned xiǎo "little/young" and the following falling tone àì "like". It is also shown that the syllables with weakened stress are produced with considerably reduced duration.4

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4 No pitch is shown over the last syllable nǎi due to creaky voice.
Sentential Stress

There is also stress at a higher level which is manifested in association with the semantics and pragmatics of the sentence. Sentence-level stress is realized as local manipulation of pitch range, such that the pitch range on a narrow-focused element within a sentence (e.g., syllable, word) becomes expanded considerably.\(^5\) The pitch range on the remainder of the phrase or sentence becomes compressed, while that over the portion prior to narrow focus is not affected (Gårding 1984, 1987, Shen, J. 1994, Jin, S.D. 1996, Xu 1999, Peng et al. 2005). In addition, the peak values vary widely, while the low values tend to remain essentially constant (Liberman and Pierrerhumbert, 1984: 159). Sentential stress and its F0 correlation are illustrated in Figure 2.4.

![Figure 2.4. Sentential Stress and F0 Correlation: Tā zuījin zhǎodào le Xīn gōngzuò "He recently got a NEW job."](image)

In the statement, Tā zuījin zhǎodào le Xīn gōngzuò "He recently got a NEW job", given in Figure 2.4, the word xīn "new" is in narrow focus. Notice the raised high pitch on this word, as indicated

\(^5\) Among the acoustic correlates, such as F0, amplitude, and duration, the F0 parameter is known to be the most crucial parameter to indicate sentential stress (Jin, S.D. 1996, Xu 1999).
by the arrow in the figure. The pitch is raised significantly more than the high tones earlier in the utterance (e.g., the high tones of the syllables tā and zuì). In contrast, the pitch over the following word gōngzuò "job" is compressed to the extent that it continues to fall to the bottom of the speaker's pitch range, with no original tonal contours realized. (See Chapter 7 for a discussion of sentential stress and question intonation.)

2.1.3 Higher-Level Prosodic Phenomena

There are some prosodic phenomena associated with higher-level prosodic units (e.g., utterance). These include declination, final lowering, and boundary tone.

Declination and Final Lowering

Declination refers to the phenomenon that the F0 range employed in a sequence of tones within a prosodic unit (e.g., phrase, utterance) becomes narrower and lower at the end than at the beginning. This downward trend is accompanied by an additional lowering effect – the final lowering effect – especially in statements (Liberman and Pierrehumbert 1984; references therein). In Mandarin, it has been found that the rate of declination is faster at the beginning and slows down as the sentence progresses, which is compatible with what has been found in English. In

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6 Due to declination, high tones in a sequence of tones within a prosodic unit become lower towards the end of the unit. See section 2.1.3 for a discussion.

7 It is also notable that a sequence of two falling tones is often realized as a long single falling contour. For instance, in Figure 2.4, the pitch on the syllable jìn starts approximately where its preceding syllable zuì ends. As a result, a long stretch of falling tone is realized over zuì and jìn.

8 This study acknowledges that this pitch lowering phenomenon, which is explained as declination here, can also be accounted for as the result of downstep, as proposed in Pierrehumbert and her colleagues' works (e.g., Pierrehumbert 1980, Liberman and Pierrehumbert 1984, etc.; see Ladd 1980 for a review of literature on declination and downstep). However, the issue of which model can provide a better account for the pitch lowering phenomenon in Mandarin remains beyond the scope of the current study.
addition, the overall F0 contour starts higher and ends lower in longer utterances (Shih 1997, 2000). The lowering of high tones due to declination is shown by the three arrows in Figure 2.5 below.⁹ (The utterance in Figure 2.5 is identical to that in Figure 2.2.)

Figure 2.5. Declination: Statement Zhōngguó déi yìng hélán "China must beat the Netherlands."

By contrast, some types of questions are realized with minimum downward trend or even a rising trend (Gårding 1984, Lee 2000, 2005). (See Chapter 5 for a discussion of the global F0 trend pattern and its relation to the syntax and semantics of an utterance.)

**Boundary Tones**

Two types of pragmatic morphemes, which are associated the the right edge of sentences, have been identified in Mandarin: High boundary tone and Low boundary tone (proposed by Peng et al., 2005). These pragmatic morphemes are probably responsible for what Chao (1968) called Rising Ending and Falling Ending, patterns which he considered to be localized to the voiced

⁹ The high pitch target of a syllable is often delayed into the next syllable. For instance, the high tone target of the rising toned-syllable hé is realized on its following syllable lán.
portion of the last syllable. However, while Chao described them as two tonal particles that can be attached to syllables bearing all types of lexical tones, Peng et al. (2005) have not identified them on syllables other than particles, which are inherently neutral-toned syllables.

Another issue important for the present study is whether we need to posit a High boundary tone in utterances where no local rise is seen in order to account for the minimum downtrend in some types of questions, such as ma-particle questions (High boundary tone in Lee 2000, Liu and Xu 2002, Peng et al. 2005 vs. no High boundary tone in Shen, J. 1985, 1994, Yang, L.M. 1995, Yuan et al. 2002, Yuan 2004). This question will be examined in more depth in Chapter 6.

Other Pitch Range Effects

Some aspects of F0 also vary in relation to the larger discourse context. In particular, variation in global pitch range is crucial for expressing pragmatic meanings. For instance, an echo-question that expresses a speaker's incredulity is usually produced with an overall raised pitch range (Lee 2000, 2005, Peng et al. 2005).

Pitch range is also important for conveying the hierarchical segmentation of the discourse, in that it tends to become expanded at the beginning of a new topic in discourse. Final lowering, on the other hand, reflects the degree of finality of an utterance in discourse. Hence, the greater the final lowering, the more there is a sense that an utterance completes a topic (Pierrehumbert and Hirschberg, 1990).

This section introduced the primary constituents of prosody in Beijing Mandarin. While many prosodic features of Mandarin discussed in previous studies (e.g., lexical tones) can be applied to Beijing Mandarin, there are also some features (e.g., word-level stress) that are rather
unique to Beijing Mandarin in particular. In the discussion of question intonation patterns in later
chapters (Chapter 5 through Chapter 7), we will refer back to the prosodic phenomena introduced
in this chapter.

2.2 Questions in Mandarin

2.2.1 Syntactic Categorization of Questions

Questions in Mandarin have often been categorized based on the types of syntactic constructions
that mark an utterance as a question. Li and Thompson (1981: 520-563), for instance, categorize
questions in Mandarin into four groups: question-word question, disjunctive question, tag
question, and particle question (e.g., *ma*-particle question). These four types are identified as
major question types in Mandarin in many studies, although the details of categorization may
differ. (See Zeng 1996 for a review of question categorization in early studies.)

*Question-word questions* refer to questions that contain a question-word such as *shéi* "who", *shénme*
"what", and *năr" where", as in *Tā qù năr?* (he - go - where) "Where is he going?".
*Disjunctive questions* include two types of questions that present the addressee with two choices.
One type of disjunctive question is the alternative question that presents two choices joined by the
morpheme *háishi" or", as in *Tā qù yīyuàn háishi chī yào?* (he - go - hospital - or - eat - medicine)
"Is he going to the hospital or taking medicine?". The other type of disjunctive question is the
Verb-not-Verb construction (V-not-V, hereafter), where a verb, or an adjective, and its negated
form (i.e., the negation marker *bù* followed by a verb or an adjective) combine to construct a yes-
no question, as in *Tā qù bù qù yīyuàn?* (he - go - not - go - hospital) "Is he going to the hospital?".

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The third type of question in Li and Thompson (1981)'s categorization is the *tag question*, which is composed of a statement followed by a V-not-V construction, as in *Tā qù yīyuàn, dui bù dui*? (he - go - hospital, right - not - right) "He is going to the hospital, right?". The last category is the *particle question*, which marks an utterance as a question by adding an utterance-final question particle (e.g., *ma*, *ne*), as in *Tā qù yīyuàn ma*? (he - go - hospital - question particle) "Is he going to the hospital?".

Although Li and Thompson (1981) do not treat it as a separate category, they briefly mention another question type, which some other studies have called the *intonation question* (e.g., Lu 1984, Liu et al. 2002). *Intonation questions* refer to questions with declarative forms that are transformed from statements into questions solely through prosodic manipulations. For example, *Tā qù yīyuàn?* (he - go - hospital) "He going to the hospital?" has the same segmental sequence as the corresponding statement *Tā qù yīyuàn "He is going to the hospital", but is distinguished from the corresponding statement by the intonation pattern. These five interrogative types in Mandarin are summarized in Table 2.2.
<table>
<thead>
<tr>
<th>Syntactic Category of the Question Types</th>
<th>Subcategory</th>
<th>Example Utterances</th>
</tr>
</thead>
</table>
| 1. Question-Word Question              |                   | 他去哪儿？ (he go where)  
"Where is he going?" |
|                                        |                   | "Where is he going?" |
| 2. Disjunctive Question                | Alternative       | 他去医院还是吃药？  
"Is he going to the hospital or taking medicine?" |
|                                        | Question          | (he go hospital or eat medicine)  
"Is he going to the hospital or taking medicine?" |
|                                        | V-not-V Question  | 他不去医院？  
"Is he going to the hospital?" |
|                                        |                   | (he go not go hospital) |
| 3. Tag Question                        |                   | 他去医院对不对？  
"He is going to the hospital, right?" |
|                                        |                   | (he go hospital right not right) |
| 4. Particle Question                   |                   | 他去医院吗？  
"Is he going to the hospital?" |
|                                        |                   | (he go hospital question particle) |
| 5. Intonation Question                 |                   | 他去医院？  
"He is going to the hospital?" |
|                                        | [Syntactically-Unmarked Yes-No Question] | (he go hospital) |

Table 2.2. Syntactic Categorization of Questions in Mandarin, adapted from Li and Thompson (1981)

This study uses the term *syntactically-unmarked yes-no question* to refer to the last interrogative type in Table 2.2 since the term *intonation question* implies that only this interrogative type is uttered with intonation that is different from that of the corresponding declarative statement.
2.2.2 Pragmatics of Questions

Since many studies on questions in Mandarin identify an utterance as a question only based on its syntactic form, an utterance in interrogative form is often equated with a question (e.g., Li and Thompson 1981, Liu et al. 2002). However, while *interrogative* and *declarative* refer to syntactic sentence types, *statement* and *question* are the names of pragmatic categories to which utterances of both interrogatives and declaratives can belong. Statements are utterances in declarative form that express commitment to the propositional content on the part of a speaker. In contrast, questions are utterances in *either* declarative form *or* interrogative form that exhibit a speaker's failure to commit to the content and ask a listener to commit to the propositional content (Gunlogson 2001).

Among the interrogative types in Mandarin presented in Table 2.2, much discussion on the pragmatics of questions has been done with *ma*-particle questions, V-not-V questions, and syntactically-unmarked yes-no questions, which are grouped together under the category of "yes-no questions" in some studies (e.g., Tiee 1986, Lee 2000). More specifically, pragmatic functions of *ma*-particle questions have been discussed with reference to those of V-not-V questions since they are functionally similar in seeking an answer that confirms or denies the proposition in the question. It has been generally agreed that V-not-V questions tend to be uttered as information-seeking questions in a neutral context in which the questioner has no assumptions concerning the proposition that is being asked. (See Lee 2000 for a review of studies on functional differences between *ma*-particle questions and V-not-V questions.)

*Ma*-particle questions, on the contrary, are uttered in a neutral or a non-neutral context. The neutrality or the non-neutrality of the *ma*-particle question is determined by the context in
which it is uttered, and the questioner can bring to the speech situation an assumption about either
the truth or the falsity of the proposition s/he is asking about. For instance, the question *Nǐ chī
pingguǒ ma?* (you - eat - apple - question particle) "Do you eat apples?" can be a
neutral information-seeking question by which the questioner asks for a yes or a no as an answer.

The questions can also be non-neutral, and the questioner may assume either that the hearer eats
apples or that s/he does not. For example, this question can be uttered in a context where the
speaker is puzzled at seeing the hearer eating an apple since the speaker thinks that the hearer
does not eat apples. In this context, the *ma*-particle question is not interchangeable with its V-not-
V counterpart (i.e., *Nǐ chī bù chī pingguǒ?* (you - eat - apple - question particle) "Do you eat apples?"
(Li and Thompson 1981: 550).

Of importance to the present study is that different pragmatic meanings and
presuppositions of a segmentally identical question are delivered by means of prosodic
manipulations (Lee 2002). For instance, the question *Lǐ Lì mǎi zhè liàng chē ma?*
(surname - first name - buy - this - classifier - car - question particle) "Is Li
Li buying this car?" can be uttered as a neutral information-seeking yes-no question. But it can
also be uttered to echo the statement that the questioner just heard to inquire about whether THIS
car is the one that Li Li is buying. It then further expresses the speaker's presupposition that THIS
car should be the last one that *Lǐ Lì* 李麗 would purchase. Figure 2.6 compares the pitch contours
of these two *ma*-particle questions. In the figure, the plain line represents the pitch contour of the
*ma*-particle question that was produced as a broad-focused information-seeking question, while
the dotted line represents that of the corresponding narrow-focused question. In the latter case,
while the overall pitch is higher, narrow focus is also realized on the word *zhè* 這 "this" with
drastically expanded pitch range, as indicated by the arrow in the figure.
Two of the major pragmatic functions of *ma*-particle questions illustrated here are *information-seeking* and *echoing*. An *Information-seeking question* refers to a question that is uttered to seek information from the addressee. An *Echo-question* is a question that echoes the statement uttered earlier in the context to express such pragmatic meanings as incredulity and surprise or to ask the addressee if the addresser has heard the statement correctly (Lee 2000).

The functional difference between an information-seeking question and an echo-question is also found in other question types such as question-word questions and syntactically-unmarked yes-no questions. Nonetheless, how different pragmatic meanings and presuppositions in these question types are expressed by means of prosody is still poorly understood. This issue will be examined in later chapters (Chapters 5 through 7).
CHAPTER 3

DISCUSSION OF EXISTING HYPOTHESES ABOUT QUESTION PROSODY IN
MANDARIN

Despite much ink spilled on discussions of prosodic differences between statements and questions in Mandarin since Chao's early works (Chao 1928, 1933, 1968), the issue still remains the subject of much debate. This chapter describes the accounts on question prosody in Mandarin proposed in early studies. Section 3.1 reviews different interpretations of the F0 implementation of question prosody in the early literature. Section 3.2 addresses early studies on the interface between question prosody and syntax/pragmatics in Mandarin.

3.1 F0 Implementation of Question Prosody

While earlier studies claim no prosodic distinction between statements and questions in Mandarin (Tsao 1967, Hu 1985, Wu 1982, etc.), an increasing number of recent experimental studies show that the F0 patterns of questions are distinguished from those of statements (Gårding 1984, Shen J. 1985, 1994, Shen, X.N. 1990, Yang, L.M. 1995, Lee 2000, 2005, Yuan et al., 2002, Yuan 2004, Peng et al. 2005). However, these studies are in disagreement over whether F0 cues crucial to signalling a question are concentrated over a certain region of an utterance (e.g., a few initial syllables or a final syllable) or are realized at a more global level (e.g., the utterance as a whole).
3.1.1 Localized F0 Effects

Using his numerical scale, Chao (1933, 1968: 812) describes how a localized rising ending is added to the last syllable: the effects of the rising ending on four types of lexical tones are 55 – 56, 35 – 36, 214 – 216, 51 – 513. Since Chao's early observation of a "rising ending" in questions, the claim that crucial F0 cues to signal a question are localized over a small portion of an utterance (e.g., the last syllable) has been widely supported. Lexical tones tend to become less intelligible at utterance-final position due to the influence of intonation (Rumjancev 1972, Vance 1977, etc.), and a localized terminal rise appears to play an important role in perception as well (Rumjancev 1972, Gussenhoven and Chen 2000). This observation is compatible with the traditional view that the use of intonation is limited to the final section of an utterance in Mandarin in order to retain lexical tones intact.

However, early studies on localized F0 effects of question prosody in fact describe different prosodic phenomena and therefore make different predictions. The most controversial issue centers on how to interpret the domain for the local F0 effects. On the whole, four hypotheses have been proposed. The first hypothesis is that the terminal rise is localized on the last syllable (Qi 1956, Chao 1968, Ho 1977, Ultan 1978, Wu 1982, etc.). In contrast, the second hypothesis views the crucial F0 cues to be associated with the last stressed syllable (Shi 1980, 1980).

More specifically, Chao (1968) views the rising/high contour to be localized to the voiced portion of the last syllable, including the voiced consonant, while Ho (1977) views it to be realized mainly on the vowel of the last syllable.
Therefore, it predicts that, if one or more neutral-toned syllables are located sentence-finally, the F0 cues should be anchored primarily to the last full-toned syllable. Note that these two hypotheses make different predictions only when the last syllable is a neutral-toned syllable. If the last syllable is a full-toned syllable, the predictions that they make are essentially identical. The third hypothesis differs from the first two hypotheses in that it identifies the terminal rise as being the rising pitch realized on the last word. The domain for the localized rise in this hypothesis is larger than a syllable unit (Rumjancev 1972).

The last hypothesis contradicts the other three hypotheses in that it characterizes the most important F0 cue in questions as higher pitch at utterance-initial position (DeFrancis 1963, Shen, X.N. 1990). While the first three hypotheses are proposed mainly based on yes-no questions (e.g., syntactically-unmarked yes-no questions, \textit{ma}-particle questions), this hypothesis is based on five types of questions (i.e., the syntactically-unmarked yes-no question, \textit{ma}-particle question, V-not-V question, alternative question, and question-word question; Shen, X.N. 1990). The observation that pitch starts higher in all five types of questions than the corresponding statements led Shen X.N. to conclude that the most crucial F0 cue is localized at utterance-initial position.

It should be noted that among the four hypotheses, only the second hypothesis explicitly predicts the F0 pattern difference between a syntactically-unmarked yes-no question and a \textit{ma}-particle question. In this hypothesis, the highest pitch is realized not on the \textit{ma}-particle but on the

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11 Some studies observed that when a neutral-toned particle is placed at the end of an utterance, the rising/high pitch tends to be realized on the stressed syllable immediately preceding the particle (Ho 1977, Ultan 1978). Ultan (1978: 227), for instance, goes on to conclude that the intonation generally ends in a slight drawl on the particle in the case of the \textit{ma}-particle question. However, these studies paid little attention to the interaction between terminal rising/high contour and stress.

12 In contrast, Qi (1956) claims that high pitch is realized across all the neutral tones when there is more than one neutral tone at the end of a \textit{ma}-particle question.
stressed syllable immediately preceding the *ma*-particle in a *ma*-particle question. By contrast, the terminal rise is localized on the last syllable in the case of a syntactically-unmarked yes-no question.

It should also be mentioned that while all four hypotheses view the localized F0 cue to be a pitch rise, some recent studies show that pitch range becomes expanded over utterance-final syllables in questions (Yuan et al. 2002, Yuan 2004).\(^1\) This suggests that, for a better understanding of local F0 effects of question prosody, we need to take into account both high pitch variation and pitch range manipulation over utterance-final syllables in questions.

### 3.1.2 Global F0 Effects

Many studies view a more global intonation trend (e.g., raised F0 register) to be the most crucial F0 cue to distinguish questions from statements. In this view, question intonation is manifested over either the entire utterance or the constituent that is larger than a word unit. Five models that represent this view need to be discussed.

First, Gårding's grid model (Gårding 1984, 1987) treats the primary prosodic difference between statements and questions as distinct slopes of grid. In this model, the "grid" consists of two parallel lines - the top line and the base line of the intonation contour. Lexical tones then fit into the range of the grid. A grid can be realized in three different directions – level, rising, or falling – to signal different speech act types (e.g., statement vs. question). For example, as

\(^1\) However, the domain for the pitch range expansion is not defined in those studies.
presented in Figure 3.1, a rising slope is realized in questions, whereas a falling slope is realized in statements. The difference between falling and rising slopes is manifested primarily over the final phrase of the grid (Gårding 1984: 86).\(^\text{14}\)

<table>
<thead>
<tr>
<th>Falling Grid (Statement)</th>
<th>Rising Grid (Question)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Falling Grid" /></td>
<td><img src="image" alt="Rising Grid" /></td>
</tr>
</tbody>
</table>

Figure 3.1. Gårding's Grid Model \(^\text{15}\)

Secondly, Shen, J. (1985, 1994) and Gao (2001) propose a model of an independently manipulated top line and base line of the pitch contour. In this model, the both top line and base line vary in interaction with communicative functions (e.g., broad focus vs. pragmatic narrow focus).\(^\text{16}\) This model describes the prosodic structure of Mandarin as prehead (\textit{diaoguan} 調冠), head (\textit{diaotou} 調頭), nucleus (\textit{diaohe} 調核), and tail (\textit{diaowei} 調尾) (Palmer 1922, Chao 1933, O’Connor and Arnold 1961, Crystal 1969, Ladd 1980), and explains that the prosodic distinction between a statement and a question is the gradually falling top line and the level or

\(^{14}\) In Gårding's model, sentential stress is represented by the width of the grid.
\(^{15}\) The figure is adapted and redrawn from a composite of Garding's figures.
\(^{16}\) According to Shen, J. (1985), the manipulation of the top line reflects the level of emphasis (i.e., narrow focus) and that of the base line manifests the strength of syntactic boundaries.
rising base line in post-nucleus position in questions. On the other hand, it describes the global F0 trend of statements as the rapid fall of both the top line and the base line. The top line and base line in the two utterance types proposed in the model are schematized in Figure 3.2.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Graph" /></td>
<td><img src="image2.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

Figure 3.2. Shen, J.’s Model

Thirdly, Shen, X.N.’s model (1989, 1990) proposes three types of "tunes" (i.e., the intonation over the entire utterance): a tune with low starting and ending keys, a tune with high starting and ending keys, and a tune with a high starting key and a low ending key. Her model further explains that the tune with low starting and ending keys is associated with statements, whereas the other two tunes - the one with high starting and ending keys and the other with a high starting key and a low ending key - represent the F0 patterns of questions. More specifically, the overall higher tune (i.e., the register with high starting and ending keys) is the question intonation realized in two types of yes-no questions (i.e., the syntactically-unmarked yes-no question and the *ma*-particle question). This is compatible with the higher "phrase curve" in questions (i.e., the straight line

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17. This model makes another important prediction about pitch range in relation to narrow focus: when pitch range gets compressed after narrow focus, it must become even narrower in questions than it does in statements due to the raised bottom line in the former. (See Chapter 7 for a detailed discussion of focus structures in questions.)

18. "Tune" is defined by four F0 points: beginning point, lowest trough, highest peak, and ending point.
defined by the beginning and the end of an utterance) in Yuan et al. (2002) and Yuan (2004). Figure 3.3 presents the three tune types that Shen, X.N.'s model proposes. In the figure, both the dashed line and the dotted line represent questions, while the plain line represents statements.

![Figure 3.3. Shen, X.N.'s Model](image)

Fourth, another account of global F0 patterns of questions views expanded pitch range to be a crucial component of question intonation (Yang, L.M. 1995, Lee 2000, 2005). In this view, the overall higher pitch trend in questions is considered to be the raised top line as a result of the expanded pitch range. As presented in Figure 3.4, Lee (2000, 2005) further proposes that questions are realized not only with the expanded pitch range but also with an overall rising trend. Hence, the pitch range becomes expanded more noticeably towards the end in questions, and consequently the pitch difference between questions and statements is expected to increase toward the end.

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Lastly, Shi (1980) also focuses on the overall pitch range in questions. However, she concludes that the overall pitch is \textit{equally} raised from the beginning to the end and that, as a result, there is \textit{no} rising slope in the overall raised pitch range in questions. This can be presented as in Figure 3.5.

Note that, out of the five models, three models - those of Gårding, Shen, J. (and Gao), and Lee - propose that the overall pitch difference between a statement and a question increases over the later portion of an utterance. However, they propose different interpretations to account for the pitch range difference between the two utterance types. In particular, Shen, J.'s model stands in stark contrast with Lee's model: while the former model predicts that the pitch range in questions
becomes compressed toward the end because of the raised base line, the latter model suggests that
the pitch range increases due to the rising trend of the overall pitch (and particularly the top line).
Gårding's model and Shi's model, on the other hand, do not predict a pitch range difference
between the two utterance types.

### 3.1.3 Discussion

As discussed in sections 3.1.1 and 3.1.2, the term "question intonation", or "question prosody", in
early studies has been used to refer to various prosodic phenomena. Some researchers regard the
most crucial acoustic cues that signal questions to be more localized cues concentrated on a
certain constituent (e.g., the last syllable). Other researchers view the global intonation patterns of
questions to be distinguished from those of statements. Furthermore, these early studies propose
different interpretations regarding how those cues are phonetically implemented.

As for the localized cues in questions, early studies explored the interplay between the
terminal rise and tonal type of the last syllable (i.e., full-toned vs. neutral-toned). Examining the
issue using syntactic constituents of different lengths and different tonal specifications at
utterance-final position will help us to achieve a better understanding of how localized cues are
manifested. (See Chapter 6 for a discussion of localized F0 cues.)

Given that many studies examined short utterances with simple syntactic structures, an
examination of utterances of different lengths will help us to understand how the global pitch
patterns vary in questions. For instance, if an equally raised pitch register throughout the
utterance is crucial in questions (as claimed by Shi 1980), we would expect to see similar F0
raising patterns in questions regardless of utterance length. On the other hand, if F0 raising at
initial-position is crucial (as argued by Shen, X.N. 1989, 1990), we would expect the F0 differences between questions and statements to decrease toward the end as the utterance becomes longer. In addition, an examination of pitch range in relation to utterance length will enable us to evaluate conflicting results that early studies have proposed (i.e., Shen, J. 1985, 1994 and Lee 2000, 2005) and to understand the role of pitch range in question prosody. (See Chapter 5 for a discussion of global intonation patterns in questions.)

It should be further noted that most studies do not take into consideration the possibility that the F0 cues are manifested at both local and global levels (Chao 1928, 1933, 1968, Rumjanec 1972, Ho 1977, Wu 1982, Kratochvil 1998, etc.). Rumjanec (1972), for instance, ignores global effects by concluding that the phonologically significant features of questions are very narrowly localized in the final regions of the sentence and that all intonational differences elsewhere (such as a higher register) are secondary and redundant. Kratochvil (1998) also draws a similar conclusion, suggesting that terminal manipulations of intonation are used as replacements of the intonations of whole sentences. Shen, X.N. (1990), on the other hand, ignores local F0 effects to focus on global pitch register manipulations in questions.

There are some studies which have considered the possibility that intonation is manipulated at both global and local levels (Shi 1980, Lee 2000, 2005, Yuan et al. 2002, Yuan 2004, Peng et al. 2005). These studies recognize that one type of intonation manipulation is not necessarily performed to the exclusion of the other. However, our understanding of how the two types of intonational cues interact with each other is still very limited. The interaction of the two types of F0 cues in questions will be examined in great detail later in Chapter 5 and Chapter 6.
3.2 Interface between Syntax/Pragmatics and Question Prosody

Another complication in understanding question prosody in Mandarin is that few studies have paid adequate attention to the interaction between question prosody and different syntactic structures and pragmatic functions of questions. Sections 3.2.1 and 3.2.2 review the small number of studies that have explored question prosody in relation to the syntax and pragmatics of questions. A discussion follows in section 3.2.3.

3.2.1 Syntax and Question Prosody

Much discussion of the interface between syntax and question prosody in Mandarin is concerned with the question of whether prosodic cues are employed to the exclusion of syntactic cues. In particular, many studies have examined two types of yes-no questions – syntactically-unmarked yes-no questions and ma-particle questions – and reached the conclusion that prosodic cues are used primarily in the absence of syntactic cues (e.g., question particles), or that even though prosodic cues are produced along with syntactic cues, they are not consistently produced (Hu 1981, 1985, Wu 1982, Liu 1988, Jin 1992, Shen, J. 1985, etc.). Hence, the term "intonation question" has often been used to refer to syntactically-unmarked yes-no questions (Liu 1988, Yang, L.M. 1995, etc.).

By contrast, some studies observed that both types of yes-no questions are prosodically distinguished from statements, and suggested that syntactic cues do not necessarily preclude the use of prosodic cues. Some of these studies find similar intonational patterns between the two types of questions (e.g., a raised global pitch register, a localized final rise) (Shen X.N. 1990, Shi
1980, etc.). On the other hand, some more recent studies propose that ma-particle questions are prosodically distinguished not only from statements but also from syntactically-unmarked yes-no questions (Yang, L.M. 1995, Lee 2000, 2005). Furthermore, they show that intonational manipulations are performed to a greater extent in the case of syntactically-unmarked yes-no questions. For instance, Yang, L.M. (1995) finds that, although the global pitch register is raised in ma-particle questions, it is not realized as high as it is in syntactically-unmarked yes-no questions. This finding is compatible with Lee (2000), who explains that both a global rising pitch trend and pitch range expansion are most exaggerated in syntactically-unmarked yes-no questions.

Other types of questions, such as the question-word question and the V-not-V question, are even less understood. According to Shen, X.N. (1990), one of the few studies on various types of syntactically-marked questions, both question-word questions and V-not-V questions are characterized as having higher pitch at utterance-initial position. The alternative question, a type of choice question, also shows a similar intonation pattern as that of the V-not-V question (Shi 1980, Shen, X.N. 1990). The intonational patterns of some syntactically-marked question types seem to interact with focus structures. For instance, narrow focus, which accompanies expanded pitch range, tends to be realized on the question-word in question-word questions (Shi 1980, Cheng 1984, Yang, L.M. 1995, Xu 2004). The out-of-the-blue V-not-V construction is often produced with narrow focus on the first verb and ends with relatively low pitch due to the pitch range compression following narrow focus (Shi 1980, Lee 2000). Hence, the high-starting and low-ending tune,

\[ \text{20} \] Interestingly, it has been reported that although pitch becomes compressed after the question word, it is still higher than that of its corresponding statement (Shi 1980, Yang, L.M. 1995).

\[ \text{21} \] Shi (1980) further finds that high pitch is realized on the word preceding haishi "or" and that falling pitch is realized on the word following haishi "or" in alternative questions.
which Shen, X.N. (1990) associates with both the question-word question and the V-not-V question may represent a focus-related phenomenon rather than a type of intrinsic question intonation type.22 (See Chapter 7 for a detailed discussion of focus and question intonation.)

The observation that questions of different syntactic structures are associated with different focus structures calls into question the traditional practice of categorizing intonational patterns in Mandarin into only two types – statement intonation and question intonation. That is, we also need to take into consideration the issue of how focus structures interact with question intonation patterns to better understand question prosody in Mandarin better. For instance, if the terminal rise is important in many types of questions, a question arises as to whether it still functions as an important F0 cue in some question types where narrow focus tends to be realized at utterance-initial or medial position. These issues will be discussed in detail in Chapter 7.

3.2.2 Pragmatics and Question Prosody

As addressed earlier in Chapter 2, the pragmatic functions of questions are determined in discourse contexts and expressed through prosodic manipulations. Nonetheless, a vast majority of previous studies of prosody in Mandarin employed read speech elicited from individual sentences with no contexts. For this reason, many early studies interpret question intonation patterns solely in association with syntactic types of questions, with no consideration of the contextual effects on question prosody. By contrast, some studies on prosody using uncontrolled spontaneous speech

22 The question-word questions examined in Shen, X.N.’s study contain the question-word at utterance-initial position. Therefore, it is questionable whether the higher starting pitch that she finds is due to the intrinsic question tune, as she claims, or due to the narrow focus that is placed on the utterance-initial question word. She also assigns the high-starting and low-ending global tune to the V-not-V question and the alternative question.
fail to identify any association between intonational patterns and syntactic structures (e.g., statements vs. questions) due to too many contextual effects that override syntactic effects (Tseng 1984, Yang L.C. 1995, Tao 1996).\footnote{The observation that there is no isomorphic relationship between the intonation contour, pitch register and sentence structure led Tao (1996: 51) to conclude that the main cue for questions is not prosodic but syntactic in Mandarin.}

A small number of studies using utterances elicited in controlled contexts shed light on the interface between pragmatics and question prosody. In particular, some findings on prosodic manipulations with regard to various presuppositions in *ma*-particle questions suggest that certain prosodic patterns are consistently produced in close connection with the pragmatics of questions (Qiu and Song 1994, Lee 2000, 2005). For instance, it has been proposed that functions such as information-seeking, confirmation-seeking, and the expression of surprise in *ma*-particle questions are expressed by register differences: a lower register is used for confirmation-seeking and a higher register for the expression of surprise (Chao 1968, Qiu and Song 1994, Lee 2000).\footnote{Qiu and Song (1994: 73) further distinguish the low register used for confirmation-seeking questions from what they call the "relatively low" register used for statements.}

Some other studies view the local pitch at utterance-final position to be a crucial cue to express the pragmatics of questions. For instance, the raising of the base line on the last stressed syllable in *ma*-particle questions expresses a speaker's expectation of hearing a response from the addressee (e.g., emphasizing a speaker's inquiry) (Hu 1985, Shen, J. 1985, Gao 2001). Peng et al. (2005: 249) also demonstrate that the localized pitch alone can change the pragmatic meanings of *ma*-particle questions: depending on whether a high boundary tone or a low boundary tone is realized on the particle *ma*, the sentence *Tāmen mài yǔsān ma?* 他們 賣 雨傘 嗎? (they - sell - umbrella - question particle) "Do they sell umbrellas?" can either deliver a speaker's presupposition that the store should sell umbrellas, or it can become like a statement which implies that it turned out that the store sold no umbrellas. Lee (2000) further proposes that pitch
manipulations at both global and local levels are simultaneously performed to express various pragmatic meanings of *ma*-particle questions (e.g., neutrality vs. non-neutrality and positive presupposition vs. negative presupposition).

A review of early studies on question prosody in relation to pragmatics reveals a need for an experimental study based on sets of utterances that are elicited under carefully controlled contexts. More specifically, an examination of segmentally-identical questions that differ from each other solely in terms of pragmatic functions will help us to distinguish contextual effects from segmental and syntactic effects.

3.2.3 Discussion

As addressed in sections 3.2.1 and 3.2.2, our understanding of the interface between question prosody and syntax / pragmatics in Mandarin is very limited. Given that many early studies make impressionistic observations on a small number of simple sentences, a systematic study which can distinguish different types of sources that contribute to the final production of question intonation patterns is needed. In particular, it is very important to distinguish acoustic features associated with the syntactic structures of questions from those correlated with the contextual effects of questions. For instance, higher pitch, which is often interpreted as a cue used for questioning, may be a signal for expressing some pragmatic functions, such as doubt or surprise. However, the F0 manipulations performed for contextual reasons have often been treated as the F0 correlates associated with certain syntactic structures of questions in many early studies. Pairs of syntactically-unmarked yes-no questions and *ma*-particle questions can be an ideal set of utterances to test both syntactic and pragmatic influences on question prosody in
Mandarin. An examination of both types of questions, which convey comparable pragmatic meanings, in comparison to the corresponding statements will enable us to understand the interaction between the presence of a syntactic cue (i.e., the *ma*-particle) and prosodic manipulations in questions. In contrast, a comparison among questions that are of the same syntactic form (e.g., *ma*-particle question) but convey different pragmatic meanings will shed light on the interface between pragmatics and question prosody. (See section 4.2 for the construction of experimental materials for the present study.)

Focus structure, which is defined within a larger context, is also crucial to understanding question prosody. Not only do question-word questions and V-not-V questions interact with narrow focus (as discussed in section 3.2.1), but yes-no questions may also be produced with different focus structures (as illustrated in section 2.2.2). Therefore, we need to account for how focus structures affect both global and localized F0 cues used to signal yes-no questions. Another issue is that an expanded pitch range, which is often found at utterance-final position in yes-no questions, may represent informational focus placed at utterance-final position. Therefore, the localized final rise that is often regarded as a cue to signal questions needs to be distinguished from a raised pitch range due to utterance-final narrow focus.
CHAPTER 4

METHODOLOGY

4.1 Design Considerations

Many studies of prosody, including the present study, attempt to understand the prosody of a natural spoken language. However, few previous studies on Mandarin achieved this goal due to the use of a set of controlled data elicited in a very restricted experimental setting. The majority of studies on sentential intonation in Mandarin are based on utterances produced in isolation or with a minimal context. Moreover, speakers in the experimental settings are often aware that they need to distinguish a given set of segmentally identical sentences solely based on prosody. Therefore, the relevance of elicited speech to natural everyday speech has been questioned (Lehiste et al. 1976, Fon 2002, etc.). Naturally-occurring spontaneous speech does not, however, readily provide a large set of utterances that are required for particular research

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25 Many early studies used a list of target sentences or a set of target utterances in minimal question-answer pairs to elicit target utterances (Shen, J. 1985, Shen, X.N. 1990, Yang 1995, Jin, S.D. 1996, Gao 2000, etc.).
26 An increasing number of studies find that since the pragmatic goals of read speech are different from those of daily conversations, the prosody of read speech does not necessarily reflect the prosody of a natural spoken language (for example, Schafer et al. (2000) for English, Peng (2002) for Mandarin Chinese, etc.).
purposes. For instance, a comparison of prosody often requires pairs of utterances that are segmentally identical or minimally different, but natural speech does not normally yield a large set of such utterances.

To obtain a large enough set of utterances that bear the contrasts of interest and that are as close as possible to natural speech, the present study employed a production task in which utterances are elicited using dialogues. The target utterances are embedded in various everyday conversations. In this manner, the utterances can be produced not in isolation but in proper and carefully controlled pragmatic contexts. We can also prevent speakers from being aware of the experimental purposes. Accordingly, although the conversations are scripted, the read-speech style in the production of the target sentences can be minimized. Therefore, the language elicited for the present study resembles spontaneous speech to a large extent, and the findings of the study contribute to the understanding of prosody that occurs in certain discourse contexts in spoken Mandarin.

Another significant aspect of the language elicited for this study comes from the careful control of dialectal variations. The language recorded in most early studies on Mandarin prosody is often described as *standard* Mandarin, with no further consideration of the varieties of the language and their potential prosodic variability. Considering the large number of speakers and wide geographical distribution of the language, however, different varieties of Mandarin very likely reveal different prosodic characteristics (Peng et al., 2005). In order to eliminate any confounding factors due to diverse varieties of the language, the present study elicited data only

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27 A number of production task techniques have been developed in recent studies to obtain a set of controlled utterances that still resemble spontaneous speech (e.g., map tasks, picture description tasks, network description tasks, cooperative game tasks). See Schafer et al., 2000 for a discussion of these methods.
from the Beijing variety of Mandarin spoken by monodialectal speakers of the language. Hence, this study contributes to a better understanding of the prosody of the language on which standard Mandarin is based.

4.2 Experimental Materials

The present study examines twenty-one sets of utterances. Each set contains four types of utterances: a statement, a syntactically-unmarked yes-no question, a ma-particle question, and a question-word question. All four types of utterances in each set are derived from the same statement. In the case of question-word questions, a question-word (e.g., shénme ‘what’, nēi ‘which’, nār ‘where’) occurs in sentence-final position. Hence, the utterances in each set are either not syntactically distinguished at all (i.e., a statement and a syntactically-unmarked yes-no question), or they are distinguished only by the sentence-final particle or the question-word (i.e., a ma-particle question and a question-word question). The target utterances are constructed in this manner so that we can observe how prosody is used to signal a question when no syntactic cues are available.

The sets of the target utterances are grouped into five categories according to the lexical tone type on the last syllable of the statement, including each of Tone 1, Tone 2, Tone 4, and the neutral tone in four sets, and Tone 3 in five sets. This is to examine the localized F0 effects of question prosody towards utterance-final position and their interaction with lexical tone types. Furthermore, to explore the interaction between stress and a localized final rise, the distance

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28 It is important to obtain segmentally identical sentences for a prosodic comparison since vowels and consonants affect F0 realization. High vowels tend to have higher fundamental frequency than mid vowels and low vowels, and higher fundamental frequencies tend to occur after a voiceless consonant than after a voiced consonant (Lehiste and Peterson 1961, Lehiste 1970, etc.). This tendency is also found in Mandarin (Li 1962, Ho 1976a: 363-367).
between the last stressed / toned syllable and the end of the utterance is also manipulated. \(^{29}\) That is, while two sets of utterances have a neutral tone that occurs on the ultimate syllable, two other sets of utterances contain two consecutive neutral-toned syllables utterance-finallly.

To examine global intonation patterns with respect to the length of an utterance, the utterances were designed such that the length ranges from four syllables to twelve syllables. However, in spite of the length difference, all target utterances consist of a single prosodic unit. The length of the last word also varies from two to five syllables. In addition, to prevent the participants from recognizing the target sentences, some words (mostly proper names) were changed using near-homophones and Tone 3 sandhi. (e.g., yīshēng 醫生, Yī Shēn 伊申; Lǐ Líng 李鈴, Lǐ Míng 李明; Xiǎo Níng 小寧, Xiǎo Míng 小明; Wū Líng 吳嶺, Wū Mǐn 武敏, Wū Líng 吳嶺).

The twenty-one sets of four target utterances were embedded in thirty-two short dialogues. \(^{30}\) One set of target utterances and the dialogue that was used for eliciting the two yes-no question types in the set are given below. The target utterances embedded in the dialogue are indicated by an arrow (→).

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\(^{29}\) See 3.1.1 for a review of different views on the terminal rise and its interaction with lexical tones in questions.

\(^{30}\) See Appendix I for the dialogues used to elicit the target utterances.
[A sample set of target utterances]

Statement:

Fàng zài nèi ge hézi lǐbiān le. "(I) put (it) in that box."31

Syntactically-unmarked yes-no question:

Fàng zài nèi ge hézi lǐbiān le? "Did (she) put (it) in that box?"

Ma-particle yes-no question:

Fàng zài nèi ge hézi lǐbiān le ma? "Did (she) put (it) in that box?"

Question-word question:

Fàng zài nèi ge hézi nèi biān ne? "Where in that box shall (I) put (it)??"

[Dialogue used to elicit the yes-no questions of the set given above]

… 王 和 張 是 夫 妻. 他 們 要 去 旅 行…
… Wáng hé Zhāng shì fūqī. Tāmen yào qù lǚxíng…
… Wang and Zhang are a married couple. They are about to go on a trip…

王: 你 看 到 照 相 机 了 嗎? Nǐ kàndào zhàoxiàngjī le ma?

“Did you see the camera?”

張: 沒 看 到. 可 是 早 上 我 看 到 你 媽 媽 正 在 收 拾 東 西.
Méi kàndào. Kěshì zǎoshàng wǒ kàndào nǐ māmā zhèngzài shōushì dōngxi.

“No, but I saw your mom organizing things in the morning.”

…. 王 注 意 到 牆 角 有 一 個 盒 子…
…. Wáng zhùyìdào qiángjiăo yǒu yī ge hézi …
… Wang noticed that there is a box at the corner…

王: 放 在 那 個 盒 子 里 邊 儿 了 嗎? Fàng zài nèi ge hézi lǐbiān le ma?

“(Did she) put (it) in that box?”

張: 我 來 打 開 看 吧. “Let me open it and see.”

31 The pronouns are translated according to the contexts used to elicit the target utterances.
Wǒ lái dǎkāi kàn ba.

... 张 打 开 了...
... Zhāng dǎkāi le...

... Zhang opened the box...

王： 放在 那 個 盒 子 里 边 儿 了？
Fāng zài nèi ge hézi lìbiān le?

张： 嗯。
En.

“Did (she) put (it) in that box?”

4.3 Participants

Thirty-nine monolingual and monodialectal speakers of Beijing Mandarin were recorded at the Phonetic Laboratory of Peking University in Beijing, China. All of them were born and raised in Beijing. Twenty subjects were female and nineteen subjects were male. They participated in the recording voluntarily and received a participation fee. Out of thirty-nine speakers, thirty-five speakers were in their twenties at the time of recording. Two were teenagers and another two were in their forties. Most of the participants were either college students or graduate students. The remainder consisted of one school teacher, one Communist Party employee, and several company employees. (For more detailed information about the participants, see Appendix II.)

4.4 Experimental Procedure

The speakers produced thirty-two short scripted conversations that contain the target utterances in their natural speed and speech style. Pairs of two speakers, who were friends, colleagues, or
siblings, participated in the recording. Two of the subjects (out of thirty-nine) participated in the recording with the experimenter's assistant. One of them and the experimenter were in the same graduate program, and the other was also a graduate student at the same university. In each pair, one speaker consistently played the role of Speaker Wang 王 and the other consistently play the role of Speaker Zhang 張 in all the dialogues. In order to ensure that each speaker performed as both interlocutors in the dialogues, the experimenter presented each dialogue twice with Speakers Wang 王 and Zhang 張 switched in the second trial. As a result, the speakers were presented a total sixty-four dialogues (32 dialogues x 2 trials = 64). The two versions of the same dialogue were never presented consecutively. The dialogues were provided in simplified Chinese characters used in the P.R.C. in one of the four randomized orders, and the four randomized orders were used approximately equally.

The participants were asked to produce the given sets of dialogues as naturally as possible at their normal speech rate so that the recorded dialogues could represent natural and spontaneous daily conversations in Beijing Mandarin. Before the recording, the experimenter told the participants that the purpose of the recording was to make audio materials to introduce the Beijing Mandarin speech style to students of Mandarin (Putonghua) and that the recorded dialogues would be used as a set of sample conversations representing spontaneous daily-conversations by Beijing Mandarin speakers. Therefore, the experimenter instructed the participants not to make too much of an effort to reduce their Beijing accent in order to produce standard Putonghua and explained that the language she aimed to record was Putonghua with a Beijing accent. (The participants were informed of the true purpose of the experiment after the recording.)
Before the recording of each dialogue, the participants were provided with time to rehearse the given dialogue once. After each rehearsal, the experimenter asked if they felt comfortable with the dialogue. If there were any words or phrases that they would not use often in their everyday conversations, they were permitted to make changes in the dialogue. As none of their suggestions involved the target sentences, the experimenter was able to make some minor changes in some of the dialogues without altering any of the target sentences.

The participants wore head-mounted microphones, and their utterances were separately recorded onto cassette tapes in a sound-attenuated room. After the recording, the experimenter interviewed the participants to assess their awareness of the experimental purposes. None of them reported that they became aware of the intention of the experiment or the target sentences during recording.

4.5 F0 Measurements

The recorded utterances were digitized using the Sound Edit 16 program at a sampling rate of 44,100 Hz. Since F0 is the most crucial acoustic parameter for tone, intonation, and sentence-level stress in Mandarin (Jin, S.D. 1996, Xu 1999, Peng et al. 2005), the present study focuses on the F0 parameter for data analysis. Using the Praat program (version 4.0), F0 values were measured on the pitch targets – the low and high tone targets – of each full-toned syllable of the utterance. Figure 4.1 presents the schematized example utterance Tā qù yǐyuàn "He is going to the hospital." to illustrate the F0 and time measurement points.
Tonal targets are labeled as H and L in the schematized F0 pattern in Figure 4.1: H and L represent high and low tonal targets, respectively. The tonal targets of the four tones are labeled as H (Tone 1), LH (Tone 2), L (Tone 3), and HL (Tone 4). When the rising contour of Tone 3 ("14" of "214") is realized, the tonal targets are labeled as L(H) to distinguish the high tone target of Tone 3 ("4") from that of the other three tones ("5"). (The tonal targets will be represented in the same way in the remaining chapters.)

Figure 4.2 further illustrates the F0 measurement points on the actual pitch contour of the same utterance Tā qù yǐyuàn ma? "Is he is going to the hospital?". The six F0 measurement points are indicated by the arrows on the pitch contour displayed on the spectrogram in the figure. In the case of Tone 1 syllables, tā and yī, the F0 value that represents H was measured at the most stable region of the vowel where the high-level F0 target is realized with the least influence from the pitch associated with the preceding and following syllables. In the case of Tone 4 syllables, qù and yuàn, the F0 value was taken from both H and L (i.e., the high-starting point and the low-ending point of the syllable). Since the syllable qù starts with a voiceless aspirated affricate [tɕʰ], the F0 value for H was measured not from the beginning point of the pitch displayed on the syllable but from the point that is no longer influenced by the voiceless segment. In both Tone 4
syllables *qù* and *yuàn*, the F0 value for L was measured at the right boundary of the syllable. In the case of the neutral-toned syllable *ma*, the F0 value was measured from the most stable area of the vowel, as shown by the last arrow in the figure.

Figure 4.2. Illustration of F0 Measurements: *Tā qù yīyuàn ma?* "Is he going to the hospital?"

Figure 4.3 presents another sample utterance *Zhāo tā dǎ lānqiú?* "(You are) looking for him to play basketball?" to illustrate the F0 measurement points on Tone 2 and Tone 3 syllables. In the Tone 3 syllables *zhāo tā*, which are realized in a low tone ("21"), the F0 value that represents L was measured from the lowest F0 point. The F0 measurement point for L on the Tone 3 syllable *zhāo* is indicated by the first arrow in the figure. Note that the low tone target of another Tone 3 syllable *dā* overlaps with that of the following Tone 2 syllable *lān*. Therefore, the F0 value that represents both the L of the Tone 3 syllable *dā* and that of the Tone 2 syllable *lān* was measured.
at the point of intersection between the two syllables. Although not shown in this sample utterance, the F0 value was also measured from the high tone target (i.e., (H) of L(H)) when Tone 3 is realized as a dipping-tone ("214").

At each measurement point, the mean F0 value across all the speakers was calculated and compared to the mean value at the corresponding syllable of the other utterance types in the same set. When no F0 values were measured from certain syllables due to creaky voice in the utterance, the F0 values measured from the same tone targets in the corresponding utterances of other types were also discarded in the statistical measurements.

Time was measured at each point where F0 was measured. In addition, time was also measured at the beginning and ending points of an utterance. With the initial point of the last full-toned syllable being Time 0 (e.g., the beginning point of the last full-toned syllable yuàn in the
example in Figure 4.2), the distance between Time 0 and each time point was also measured. This is to observe global F0 patterns of different utterance types effectively. That is, by overlaying F0 contours of difference types of utterances with reference to Time 0, we can compare their global F0 patterns effectively despite length differences and different final lengthening effects.\footnote{For instance, a \textit{ma}-particle question has one additional syllable in comparison to its corresponding statement. Therefore, final lengthening effects are realized on the \textit{ma}-particle in \textit{ma}-particle questions, whereas the utterance-final syllable becomes lengthened in statements and syntactically-unmarked yes-no questions.}
CHAPTER 5

RESULT I: PRAGMATICS AND GLOBAL INTONATION PATTERNS OF YES-NO QUESTIONS

This chapter presents the intonation patterns of yes-no questions with reference to the pragmatic functions of questions. In particular, the global manipulations of both the top line and base line in two types of yes-no questions (i.e., syntactically-unmarked yes-no questions and syntactically-marked ma-particle questions) are examined in comparison with those in the corresponding statements. They are also discussed in relation to the two major pragmatic functions of yes-no questions - information-seeking and echoing to express pragmatic meanings such as incredulity. Section 5.1 introduces the two pragmatic functions of yes-no questions that were elicited for this study, and section 5.2 presents the global F0 trends of yes-no questions with regard to question pragmatics. A summary and discussion follow in section 5.3.

5.1 Categorization of Yes-No Questions and Terminology

Two types of yes-no questions that will be examined in this chapter are the syntactically-unmarked yes-no question (hereafter, UMQ) and the syntactically-marked (yes-no) ma-particle
question (hereafter, MQ). With respect to syntax, these two question types differ from each other only by the presence or absence of the *ma*-particle. Hence, except for the particle at the end of the utterance, they are syntactically identical to each other as well as to the corresponding statement.

For both MQ and UMQ, presuppositions and communicative functions can vary in close relation to contextual factors. As illustrated in section 2.2.2, a MQ can be uttered as a genuine information-seeking question or as a question that expresses such pragmatic meanings as surprise and incredulity. Likewise, the pragmatic functions of a UMQ also interact with the discourse contexts in which the question occurs. Although a UMQ is more likely to function as a non-neutral question that presumes a certain response from a listener or expresses a specific pragmatic meaning, it can also be uttered as an information-seeking question. Furthermore, the discourse context also determines which part of the utterance (e.g., a certain word in the utterance or the entire utterance) is most crucial for conveying question information.

For both MQ and UMQ, two major pragmatic categories are of particular interest to the present study: the Information-seeking question and the Echo-question. An information-seeking question (InfoSeek, hereafter) is defined as a type of question that is uttered to seek information from the addressee. An echo-question, on the other hand, is a question which echoes what has been uttered in an earlier statement and expresses surprise or requests confirmation. Below, Dialogue A shows an Echo-UMQ, and Dialogue B shows an InfoSeek-MQ.

**Dialogue A: Echo-UMQ**

…王和张在路上看著李先生...
…*Wáng hé Zhāng zài lù shàng kànzhe Lǐ xiānshēng*…
(… Wang and Zhang are looking at Mr. Li on the street …)

王: 他去哪儿?  
*Tā qù nǎr?*  
“Where is he going?”

张: 他去医院.  
“He is going to the hospital.”
王：
他去醫院嗎？
Tā qù yīyuàn ma?
张：
嗯.
“Yes.”
En.

王：
他生病了嗎？
Tā shēng bìng le ma?
张：
沒有. 他媽 媽 住 院 了. 他 看 他 媽 媽.
Méiyǒu. Tā māma zhùyuàn le. Tā qù kàn tā māma.
“No. His mom got hospitalized. He is going to see his mom.”

Dialogue B: InfoSeek-MQ

… 王和張在辦公室看到李先生正在請病假…
… Wáng hé Zhāng zài bàngōngshì kàndào Lǐ xiānsheng zhèngzài qǐng bìngjià.
(… In the office, Wang and Zhang see Mr. Li requesting sick leave …)

王：
他去醫院嗎？
Tā qù yīyuàn ma?
张：
嗯. 他支 气 管 炎 又 犯 了.
“Yes. He' has bronchitis again.”

En. Tā zhīqìguānyán yòu fàn le.

… 第二天… (Next day)
… Dì èr tiān…

王：
他昨 天 看 醫 生 了嗎？
Tā zuótiān qù kàn yīshēng le ma?
张：
他昨 天 看 醫 生 了.
“(Yes.) He saw a doctor yesterday.”

Tā zuótiān qù kàn yīshēng le.

王：
那. 他 為 什 麼 沒 來 上 班？
Nà, tā wèi shénme méi lái shàngbān?
张：
他 來 了. 我 剛 才 看見 他 了.
“He did come. I saw him a minute ago.”

Tā lái le. Wǒ gāngcái kànjiàn tā le.

In Dialogue A, Speaker Wang's UMQ echoes the immediately preceding statement Tā qù yīyuàn “He is going to the hospital”. He echoes the statement to express his surprise about Mr. Li going to the hospital and to make sure he heard the statement correctly. He expects "yes" as an answer, and perhaps an elaboration. In contrast, Speaker Wang's MQ in Dialogue B asks the other
interlocutor whether Mr. Li is going to the hospital but does not presuppose either "yes" or "no" as an answer. In both cases, the last word, yīyuàn "hospital", is crucial for conveying the pragmatic meaning of surprise (UMQ, Dialogue A) and the information that the speaker is inquiring about (MQ, Dialogue B).³³

The other two types of questions are the InfoSeek-UMQ and the Echo-MQ. Dialogue C shows an InfoSeek-UMQ, and Dialogue D shows an Echo-MQ.

Dialogue C: InfoSeek-UMQ

… 王和张是夫妻，他们要去旅行…
… Wang and Zhang are a married couple. They are about to go on a trip…

王：你看到照相机了吗？
Nǐ kàndào zhàoxiàngjī le ma?
“Did you see the camera?”

张：没看到，可是早上我看到你妈妈正在收拾东西。
Méi kàndào. Kěshì zǎoshàng wǒ kàndào nǐ māma zhèngzài shōushí dōngxi.
“No, but I saw your mom organizing things in the morning.”

王：注意到墙角有一个盒子…
Wáng zhùyìdào qiángjiǎo yǒu yī ge hézi …
Wang noticed that there is a box in the corner…

王：（他）找个盒子里边了没有？
(Fá) zài nèi ge hézi lǐ biān le mǎ?
“(Did she) put (it) in that box?”

张：我来打开会吧。
Wǒ lái dǎkāi kàn ba.
“Let me open it and see.”

张打开了…
Zhāng dǎkāi le…
Zhang opened (the box)…

王：（他）找个盒子里边了没有？
(Fá) zài nèi ge hézi lǐ biān le mǎ?
“(Did she) put (it) in that box?”

张：嗯。
En.
“Yes.”

³³ See Haan (2002) for the claim that the inherent focus is on the object in yes-no questions.
In Dialogue C, Speaker Wang's UMQ is produced to ask for the information regarding whether Wang's mother put the camera in that box or not. The other interlocutor is then expected to provide the relevant information by stating yes or no as an answer. Therefore, the UMQ in Dialogue C corresponds to the MQ in Dialogue B in terms of the pragmatic function of the question. On the other hand, Speaker Wang's MQ in Dialogue D echoes the immediately preceding statement \( Tā qù yīlóu chī màiđāngláo. \) 他 去 一 樓 吃 麥當 勞 “He went to the first floor to eat at McDonald's.” and expresses his surprise about the person under discussion eating at McDonald's on the first floor. Hence, the pragmatic meaning of the MQ in Dialogue D resembles that of the UMQ in Dialogue A. Table 2 below summarizes the four question types categorized by both syntax and pragmatic functions in the present study:
Table 5.1. Syntax and Pragmatics of Four Yes-No Question Types

<table>
<thead>
<tr>
<th>PRAGMATICS</th>
<th>SYNTAX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Syntactically-Unmarked Yes-No Question</td>
</tr>
<tr>
<td>Echo-Question</td>
<td>Echo-UMQ [Dialogue A]</td>
</tr>
<tr>
<td>Information-Seeking</td>
<td>InfoSeek-UMQ [Dialogue C]</td>
</tr>
<tr>
<td></td>
<td>Syntactically-Marked Ma-Particle Yes-No Question</td>
</tr>
<tr>
<td></td>
<td>Echo-MQ [Dialogue D]</td>
</tr>
<tr>
<td></td>
<td>InfoSeek-MQ [Dialogue B]</td>
</tr>
</tbody>
</table>

As shown in Table 5.1, the four yes-no question types that will be examined in this chapter are InfoSeek-MQ, Echo-MQ, InfoSeek-UMQ, and Echo-UMQ. By limiting the scope of the syntactic types and pragmatic functions of yes-no questions to these four types of combinations, we can obtain a better understanding of the intonation patterns of questions that take into account both syntax and pragmatics. Consequently, global intonation patterns will be discussed in relation to these four question categories in the remainder of this chapter.

5.2 Global F0 Trend: Top Line and Pitch Range

As discussed in section 3.1.2, several hypotheses have been proposed to explain the global intonation patterns of questions. Section 5.2.1 presents four schematized hypotheses with a discussion of their different predictions on global pitch range manipulations as well as the interaction between utterance length and intonation patterns. Sections 5.2.2 and 5.2.3 present the
global intonation patterns found in the four types of yes-no questions and discuss the interface between intonational patterns and the syntax and pragmatics of yes-no questions. The chapter concludes with a summary and discussion in section 5.3.

5.2.1 Hypotheses

Although many studies have noted that pitch becomes higher in questions than in statements, they have proposed different hypotheses about the global pitch patterns in questions. Figure 5.1 provides the schematized representation of four hypotheses proposed in earlier studies:

A. Overall Raising

B. Overall Raising with Rising Slope

C. Initial Raising

D. Overall Pitch Raising and Local Final Rise

Figure 5.1. Schematized Representation of Hypotheses about the Global Pitch Pattern in Questions

34 All the graphic representations provided here are mine.
Hypothesis A shows that the overall F0 contour is raised approximately equally throughout the utterance in question (Shi 1980). Hypothesis B, on the other hand, predicts that the F0 contour in a question is not only raised but also is realized with a rising slope. Therefore, it predicts that the F0 difference between the two utterance types increases toward utterance-final position (Yang, L.M. 1995, Lee 2000). Hypothesis C is in sharp contrast with Hypothesis B by predicting a crucial F0 rise at the utterance-initial position while the pitch ends only slightly higher or at roughly the same pitch in a question as in a statement. (DeFrancis 1963, Shen, X.N. 1990). Hypothesis D, like Hypothesis B, predicts that the F0 difference between a statement and a question increases towards utterance-final position. The difference between the two hypotheses is that while Hypothesis B predicts a gradual increase of pitch in questions, Hypothesis D expects the overall pitch rise to become noticeably exaggerated over the last syllable(s) in questions (Yuan et al. 2002, Yuan 2004).

These hypotheses also make different predictions as to the interaction between utterance length and question intonation patterns. That is, Hypothesis A predicts that utterance length does not affect question intonation patterns. In contrast, Hypotheses B, C, and D all predict an effect of utterance length. Hypotheses B and D predict either that the increasing F0 difference may be found at the final position in longer utterances or that the F0 difference may decrease at the initial position as the utterance becomes longer. Hypothesis C predicts that the F0 difference at the final position decreases in longer utterances. (This issue will be examined in detail in Section 5.2.2.)

The hypotheses were put forth primarily based on top line manipulations. Therefore, they do not account for how the base line and pitch range are manipulated in questions, and in fact only a few studies (e.g., Shen, J., 1985, Lee 2000, 2005) have addressed pitch range manipulation in questions. However, it is necessary to take into consideration the base line as well as the top
line since the raised top line in questions can be due to a raised register or to an expanded pitch range. For instance, while both Yang (1996) and Lee (2000) view the raised top line in questions as being due to an expanded pitch range, Shen, J. (1985) states that the pitch range becomes narrower in questions since the base line is also raised. (See section 2.1.2 for a discussion of the top line variation in pitch range expansion.)

It should also be noted that the hypotheses presented in Figure 5.1 generalize the intonation patterns in questions, and do not take into consideration various syntactic structures and pragmatic functions of questions. However, it is unlikely that the same intonation pattern would be produced across different syntactic forms and pragmatic functions of questions. Instead, it is very likely that syntactic and pragmatic factors would affect the intonation patterns of questions. The global intonation patterns and their interaction with syntax and pragmatics will receive greater elaboration and investigation in sections 5.2.2 through 5.2.5.

5.2.2 Echo-UMQ and InfoSeek-MQ

The first pair of yes-no questions to be examined are Echo-UMQ and InfoSeek-MQ. Sections 5.2.2.1 and 5.2.2.2 show the global pitch patterns of these two question types in comparison with those of the corresponding statements. In order to account for the interaction between intonation patterns and utterance length, section 5.2.2.1 first examines the global intonation patterns of short utterances. Longer utterances are examined in section 5.2.2.2.
5.2.2.1 Short Utterances

The first set of short utterances includes the four-syllable statement Tā qù yīyuàn. "He is going to the hospital." and the corresponding Echo-UMQ and InfoSeek-MQ. Figure 5.2 below presents the overlaid pitch contours of the three utterance types produced by a female speaker. (The thick plain line represents the pitch contour of the statement. The dashed line and the thin plain line show the pitch contour of the UMQ and that of the MQ, respectively.)

Figure 5.2 clearly shows that the overall intonation of the UMQ is realized highest, while that of the statement is realized lowest. Further note that the F0 differences among the three utterance
types increase significantly toward utterance-final position. In particular, the biggest F0 difference between the two question types, as well as among the three utterance types, is seen on the high tone target across the last word yīyuàn "hospital".

To see if the F0 patterns observed from one speaker are consistently produced across different speakers, we need to turn to Figure 5.3. It presents the top lines of the three utterance types. The points plotted are the mean F0 values that were measured from the high tone targets in the utterances produced by all the subjects in this study. The points are then linked for each of the sentence types in the figure. The high tone targets that are plotted occur in the syllables tā, qù, yī, and yuàn. (Also refer to the representation of the tone targets at the top of the figure. The high tone targets marked with a large dot (●) are the ones from which F0 values are measured to obtain the top lines.) The Y-axis and the X-axis in the figure represent the mean F0 values and the mean times, respectively. (As mentioned in section 4.5, Time 0 in the figure corresponds to the initial point of the last full-toned syllable.)

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35 See Dialogue 1 and Dialogue 2 in Appendix I for the contexts used to elicit this set of utterances.
36 Segmentation in Figure 5.2 is based on the statement. The waveform also corresponds to the statement.
Figure 5.3. Top Lines: Statement Tā qù yīyuàn "He is going to the hospital" and Corresponding Echo-UMQ and InfoSeek-MQ

The F0 patterns shown in Figure 5.3 above largely resemble those observed from an individual speaker in Figure 5.2. First, the overall top line is higher in both question types than in statements. Importantly, as seen in Figure 5.2, while the pitch starts higher in both questions, the F0 rise increases toward the end. This trend is particularly salient in the UMQ. Second, also note that the pitch-raising is performed to the greatest extent in the absence of the syntactic cue (i.e., UMQ). This seems to suggest that intonational cues become more crucial when questions

\[37\] The third high tone target taken from the syllable yī is considerably lower than that of the following syllable yuàn. This is because the originally high-toned syllable yī immediately follows the falling-toned syllable qù and is therefore realized as a rising tone.
are syntactically-unmarked. However, this does not necessarily indicate that prosodic cues are not important in syntactically-marked questions given that the pitch-raising takes place even in the presence of a syntactic cue (i.e., the *ma*-particle).

What is not yet clear from the above observations is whether pitch-raising in the two types of questions is due to the independent raising of the top line or to an expanded pitch range, since only the top line is examined in Figure 5.3. To explore this issue, both top lines and base lines are plotted for comparison in Figure 5.4. In the figure, the solid lines are the top lines, whereas the dotted lines are the base lines. These are plotted across the two falling-tone syllables, *qù* and *yuàn*. In the case of MQ, the ending point of the base line was taken not from *yuàn* but from the *ma*-particle.38 (In the representation of the tonal targets given above Figure 5.4, the high tone and low tone targets marked with • are the ones from which F0 values were measured to obtain the top lines and base lines. For example, the falling tone on *qù* has a sequence of high and low tone targets, HL; as a result, the H tone target is plotted to obtain the top line, while the L tone target is plotted to obtain the base line.)

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38 Since the pitch continues to fall, extending to the *ma*-particle, the lowest pitch is realized not on the last full-toned syllable *yuàn* but on the *ma*-particle.
In Figure 5.4, the plotting and overlaying of the top lines and base lines of the three utterance types reveal some important points. First, with respect to the two types of questions, both the top line and base line are raised throughout the utterance in these two types of questions; however, more significant are the F0 differences between the two top lines than between the two base lines. As a result, the overall pitch range - the distance between the top line and the base line - is notably increased in both question types. This difference is evident when we compare the pitch range marked by MQ1 with that marked by MQ2. Similarly, it is also obvious when we compare the pitch range marked by UMQ1 with that marked by UMQ2.
Second, for all three utterance types, the pitch range becomes wider toward the end. This is due to the declining slope of the base line and the rising slope of the top line. Furthermore, among the three sentence types, it is in the UMQ that the top line is realized with the steepest rising slope. As a result, the pitch range is expanded to the greatest extent in the UMQ, as can be seen by comparing UMQ2 to S2 and MQ2.

Another set of short utterances to be examined is the five-syllable statement Zhāo tā dā lánqiú. "(I am) looking for him to play basketball" and the corresponding Echo-UMQ and InfoSeek-MQ. Both the top lines and base lines of the three utterance types are presented in Figure 5.5. In the top lines - the solid lines - the three points are the mean F0 values measured from the high tone targets of the syllables tā, lán, and qiú. In the case of MQ, the last point in the top line was measured not from qíu but from the ma-particle. In the base lines - the dotted lines - the three points are the mean F0 values measured from the low tone targets of the syllables zhāo, dā (=lán), and qiú.

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39 See Dialogue 3 and Dialogue 4 in Appendix I for the contexts used to elicit this set of utterances.
40 Since the pitch continues to rise onto the ma-particle, the highest pitch is realized not on the last full-toned syllable qíu but actually on the ma-particle.
41 Since the rising tone of the syllable lán starts at the lowest pitch point of the low tone syllable dā, the low tone targets of the two syllables are phonetically identical. Therefore, the low tone target was measured at the point of intersection between the two syllables.
In Figure 5.5, a visual inspection of the top lines and base lines reveals obvious differences between them. While there is little variation among the base lines, the top lines show noticeable manipulation. The two types of questions are both characterized by a raised top line, resulting in an expanded pitch range. Furthermore, across the three sentence types, the overall pitch range is expanded to the greatest extent in the UMQ.

Another important contrast among the three sentence types in Figure 5.5 pertains to the slope of the top line: while the top line declines notably only in the statement, the top line in the UMQ is realized with an overall rising slope. In the case of MQ, the top line declines slightly.
before rising toward the end of the utterance. As a result, the MQ lies between the statement and the UMQ in sharing some characteristics of the statement (viz., declination) and some of the UMQ (viz., rising toward the end of the utterance).

Also note that the sharp rising slope of the top line in the UMQ results in a considerable expansion of pitch range toward the utterance-final position, while pitch range decreases significantly in the statement. In the MQ, although pitch range is not expanded as much as in the UMQ, it is noticeably wider than in the statement. The difference in pitch range between the MQ and the statement increases towards the end of the utterance.

From the intonation patterns presented in Figure 5.4 and Figure 5.5, what signals a question may not simply be the raising of the top line. Instead, the pitch range expands toward the end in both question types. This trend is particularly salient in the case of the UMQ. Furthermore, the overall rising slope of the top line in the two question types and the declination of the top line in statements make the pitch range differences among the three utterance types increase towards the end of the utterance.

5.2.2.2 Longer Utterances

An examination of the short utterances in Figures 5.4 and 5.5 shows the interaction between utterance types and pitch range patterns. Examining longer utterances, which still consist of a single intonational unit, will help us to gain a better understanding of the interaction between utterance length and intonation patterns. Another benefit of exploring longer utterances is that we can address the question of whether the pitch range in questions becomes expanded gradually (Hypothesis B) or whether it increases sharply in a final portion of the utterance (Hypothesis D).
Since longer utterances consist of more syntactic constituents than short utterances, we can further observe whether a sharp increase in pitch range takes place over a certain syntactic constituent in the question. These issues will be discussed using two sets of examples displayed in Figures 5.6 and 5.7.

The first set of utterances to be examined is the nine-syllable statement 讨嘴进苗dao le xīn gōngzuò ("He recently found a new job") and the corresponding Echo-UMQ and InfoSeek-MQ in Figure 5.6. In the top lines (the solid lines), the six points are the mean F0 values measured from the high tone targets of the syllables tā, zuì, jìn, xīn, gōng, and zuò. In the base lines (the dotted lines), the three points are the mean F0 values measured from the low tone targets of the syllables jìn, zhǎo and zuò. The last point in the base line in the MQ was taken not from zuò but from the ma-particle.

42 See Dialogue 5 and Dialogue 6 in Appendix I for the contexts used to elicit this set of utterances.
43 As elsewhere in this study, mean F0 values were obtained across all subjects.
44 The falling tone on the syllable dào is not included in either the top line or the base line since it is usually unstressed and loses its tone in Beijing Mandarin.
45 As the pitch continues to fall onto the ma-particle, the lowest pitch is realized not on the last full-toned syllable zuò but on the ma-particle.
There are some important similarities between the short utterances in Figure 5.5 (section 5.2.2.1) and these longer utterances (Figure 5.6). First, while the top lines vary to a larger extent than do the base lines, both question types are characterized by higher top lines. Second, an overall rising trend is the most noticeable in the UMQ. Third, while pitch range is expanded in the two question types, the most salient expansion of pitch range is seen at the end of the utterance in the UMQ (i.e., the last three points in the figure). This is in contrast with the reduced pitch range shown
toward the end of the statement. In the case of the MQ, while the rising trend in the top line is not as noticeable as that in the UMQ, the pitch range at the end is still wider than that in the statement.

The F0 patterns shown in Figure 5.6 suggest that pitch range tends to expand towards the end of the utterance even in longer questions. Furthermore, in addition to the overall expanded pitch range, a more localized F0 raising may be realized over a certain domain towards the end of the utterance in questions. (Localized F0 effects of question intonation will be discussed in Chapter 6.)

The next set of utterances is shown in Figure 5.7. They contain the nine-syllable statement \textit{Lǐ Xīn míngnián yào qù xīnxīlán} ("Li Xin is going to New Zealand next year.") and its corresponding Echo-UMQ and InfoSeek-MQ. This set of utterances exhibits patterns similar to those found in Figure 5.6. In Figure 5.7, the six points in the top lines (the solid lines) are the mean F0 values measured from the high tone targets of the syllables \textit{xīn}, \textit{míng}, \textit{nián} (=\textit{yào}), \textit{xīn xī}, and \textit{lán}. The last point in the top line of the MQ is not from \textit{lán} but from the \textit{ma}-particle. The two points in the base lines (the dotted lines) are the mean F0 values measured from the low tone targets of the syllables \textit{xīn}, \textit{qù}, and \textit{lán}.

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46 See Dialogue 5 and Dialogue 6 in Appendix I for the contexts used to elicit this set of utterances.
47 The high target of \textit{nián} serves as the high target of the following syllable \textit{yào}. Hence, only one high target is plotted in the figure.
48 The high tone target of the falling tone syllable \textit{qù} is not fully realized. Rather, it tends to start at the low tone target of the preceding syllable \textit{yào}. As a result, the high target of \textit{qù} is not plotted in the top line.
49 Since the rising tone of the syllable \textit{lán} continues to rise on the \textit{ma}-particle, the highest pitch is realized not on the last full-toned syllable \textit{lán} but on the \textit{ma}-particle.
50 The low tone target from the first syllable \textit{Lǐ} is not included since most speakers produced this syllable with creaky voice.
There are striking similarities between the F0 patterns presented in Figure 5.7 and those in Figure 5.6. The top line is realized highest in the UMQ and lowest in the statement, with that of the MQ being placed in between. The most expanded pitch range and the overall rising trend of the top line are very clearly shown in the UMQ. As for the MQ, although the pitch range does not become expanded as much, the overall pitch is still higher than that in the statement.

Further note that the pitch range becomes expanded toward the end in both the MQ and the UMQ, which contrasts with the reduced pitch range at the very end in the statement. This
suggests that there may be another motivation for a more localized F0 raising toward utterance-final position. (This will be investigated in more detail in the following sections as well as in Chapter 6.)

In sections 5.2.2.1 and 5.2.2.2, the global intonation patterns of Echo-UMQs and InfoSeek-MQs are examined in comparison to those of the corresponding statements. In both shorter and longer utterances, the intonation patterns of UMQs are realized with the highest overall pitch and the steepest rising trend. Although the intonation patterns of MQs are not realized as high as those of the corresponding UMQs, they are still higher than those of the corresponding statements. In terms of pitch range, UMQs show the most expanded pitch range. Examination of longer utterances also shows considerable pitch range expansion toward the end of the utterance in both UMQs and MQs. This suggests a more localized F0 raising at utterance-final position. The global pitch patterns of the Echo-UMQ and Info-MQ can be schematized as in Figure 5.8 below:

![Figure 5.8. Schematized Global Pitch Patterns of the Echo-UMQs and InfoSeek-MQs](image)
What remains to be examined is whether these global pitch patterns are realized in questions that express different pragmatic meanings. For instance, would pitch range expand to a comparable degree when an UMQ is uttered as an InfoSeek-question? This question will be answered in the following section.

5.2.3 InfoSeek-UMQ and InfoSeek-MQ

Both the UMQs and MQs examined in this section are elicited as genuinely information-seeking questions. The contexts used to elicit InfoSeek-questions were designed so that the noun phrase or locative in sentence-final position conveys the question information, namely, about which the questioner makes an inquiry.

The first set of utterances to be examined is the six-syllable statement TCHA xihuan kan dianying "He/She likes watching movies" and the corresponding UMQ and MQ. In Figure 5.9, the top lines (the solid lines) are composed of the mean F0 values measured from the high tone targets of the syllables ta, kan, dian, and ying. In the case of the MQ, the last point is taken not from ying but from the ma-particle. In the base lines (the dotted lines), the four points are the mean F0 values measured from the low tone targets of the syllables xi, kan, dian, and ying.

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51 See Dialogue 7 and Dialogue 8 in Appendix I for the contexts used to elicit this set of utterances.
52 As mentioned in section 4.5, the high tone target of Tone 3, which is transcribed as "4" in "214" in Chao's numeric system, is seldom produced in statements. Although the high tone target is often produced in questions, it is not as high as that of Tone 1 ("5" in "55") or that of Tone 4 ("5" in "51"). Therefore, in the tone target display given at the top of Figure 5.9, the high tone target of the Tone 3 syllable ying, although labelled H, is placed within parentheses: (H). (See Chapter 2 for the phonetic surface forms of Tone 3; also see Chapter 6 for a discussion of the pitch patterns of the utterance-final Tone 3 in questions.)
53 Since the pitch continues to rise onto the ma-particle, the highest pitch is realized not on the dipping tone syllable ying but on the ma-particle. Therefore, the high pitch value was measured from the ma-particle.
The pitch patterns in Figure 5.9 reveal important similarities with, and differences from, the F0 patterns discussed in the previous sections (namely, Echo-UMQs and InfoSeek-MQs in Figures 5.4 through 5.7 in sections 5.2.2.1 and 5.2.2.2). With respect to similarities, the top line is raised in both question types throughout the utterance. In addition, the pitch range differences among the three utterance types increase considerably toward the end. These patterns are found both in the pairs of Echo-UMQ and InfoSeek-MQ examined earlier (in Figures 5.4 through 5.7) and in the InfoSeek-UMQ and InfoSeek-MQ pair shown in Figure 5.9 above.
Nonetheless, some important differences are also observed, particularly in the F0 pattern of the UMQ. Recall that the pitch range of the Echo-UMQ is notably wider than those of the corresponding MQ and statement even at the utterance-initial position (as shown in Figures 5.4 through 5.7 in sections 5.2.2.1 and 5.2.2.2). However, as seen in Figure 5.9, the pitch range over the early part of the utterance in the InfoSeek-UMQ is not realized much wider than that of the MQ or the statement. Instead, the pitch range becomes expanded primarily over the later part of the utterance in the UMQ, just as it does in the MQ. As a result, the overall intonation pattern of the UMQ is strikingly similar to that of the MQ in Figure 5.9.

Figure 5.10 displays another set of utterances which contains the nine-syllable statement Tā qù Yǒuli shāngdiàn mǎi niuròu "He went to the Youli store to buy beef" and the corresponding UMQ and MQ. In the figure, the top line (the solid line) is a sequence of the mean F0 values from the high tone targets of the syllables tā, qù, lì, shāng, diàn, and niú (=ròu). The base line (the dotted line) is a series of the low tone targets taken from the syllables qù, yǒu, lì, diàn, mǎi (=niú), and ròu. In the MQ, the last point in the base line was taken not from ròu but from the ma-particle.

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54 See Dialogue 9 and Dialogue 10 in Appendix I for the contexts used to elicit this set of utterances.
55 Since the high tone of the falling tone syllable ròu starts at the high tone of its preceding rising tone syllable niú, the high tone targets of the two syllables are identical.
56 The syllable mǎi is realized as a low tone with no rising portion ("14" of "214"). And the low tone target of its following syllable niú is realized at the lowest pitch point of the syllable mǎi. Therefore, the low tone target of mǎi is the same as that of niú.
57 The pitch falls across the last full-toned syllable and the ma-particle. Therefore, the lowest pitch value was taken not from the syllable ròu but from the ma-particle.
Figure 5.10. Top Lines and Base Lines: Statement *Tā qù Yòuli shāngdiàn mǎi niú ròu (ma)* "He went to the Youli store to buy beef" and Corresponding InfoSeek-UMQ and InfoSeek-MQ

The pitch patterns in Figure 5.10 show that while the top lines are raised throughout the utterance in both question types, the pitch range, particularly in the early portion of the question, does not differ substantially from that of the statement.\(^{58}\) This is remarkably similar to the patterns observed in the short utterances presented in Figure 5.9. (To see the intonational differences between Echo-UMQs and InfoSeek-UMQs, compare the pitch patterns shown in Figure 5.10 above and those presented earlier in Figure 5.6 in section 5.2.2.2. The two sets have the same tone (Tone 4) on the last-stressed syllable (i.e., *ròu, zuò*) and the same number of syllables (i.e., nine

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\(^{58}\) Since the second syllable of the disyllabic word *Yòuli* tends to be produced with reduced stress in Beijing Mandarin, the pitch on this syllable is realized very low.
syllables)). Furthermore, the top line differences between the two question types are seen mainly over the later part of the utterance. This pattern also parallels the pattern seen in the short utterances in Figure 5.9 but is more clearly seen in the longer utterances in Figure 5.10.

One of the crucial differences in the F0 patterns between the pair of Echo-UMQ and InfoSeek-MQ in Figures 5.2 through 5.7 (section 5.2.2) and the pair of InfoSeek-UMQ and InfoSeek-MQ in Figures 5.9 and 5.10 (section 5.2.3) is the less expanded pitch range that is seen most obviously over the early portion of the utterance in the InfoSeek-UMQ. As a result, the overall pitch register and the pitch range of the UMQ resemble those of the MQ in the InfoSeek-UMQ and InfoSeek-MQ pair. The notable difference in the global intonation patterns between Echo-UMQs and InfoSeek-UMQs suggests that the global intonation patterns are realized in close connection with the pragmatics of question utterances. In particular, the substantially expanded pitch range found in Echo-UMQs may be associated with the pragmatic function of the question type, that is, expressing a questioner's surprise or incredulity.

The remarkable resemblance in intonation patterns between InfoSeek-UMQs and InfoSeek-MQs supports the conjecture that global intonation patterns are realized in interaction with the pragmatics of questions. It can be also observed that the overall pitch becomes higher in InfoSeek-UMQs than in InfoSeek-MQs, especially over the last portion of the utterance (Figures 5.9 and 5.10). This suggests the possibility that expansion of pitch range and raising of the top line toward the end of the utterance in InfoSeek-UMQs may be due to compensation for the absence of a syntactic cue (i.e., the ma-particle in this case). The global pitch patterns of InfoSeek-UMQs and InfoSeek-MQs can be schematized as in Figure 5.11 below:
To further investigate the interaction between question intonation patterns and the syntax and pragmatics of questions, we will examine the other two pairs - Echo-UMQ and Echo-MQ on the one hand in section 5.2.4, and InfoSeek-UMQ and Echo-MQ on the other in section 5.2.5.

5.2.4 Echo-UMQ and Echo-MQ

The significantly expanded overall pitch range found in Echo-UMQs but not in either InfoSeek-UMQs or InfoSeek-MQs (in sections 5.2.2 and 5.2.3) is in line with the association between the expression of surprise or incredulity and expanded pitch range observed across languages (Gunlogson 2001 and references therein). The next question, then, is whether Echo-MQs would also be produced with expanded pitch range. If so, how are the intonation patterns similar to or different from those observed in Echo-UMQs? To answer these questions, we need first to examine the Echo-MQ and Echo-UMQ pair.

Figure 5.12 shows the eight-syllable statement Tā qù yǐlóu chī màidāngláo “He/she went down to the first floor to eat at McDonald's” and the corresponding UMQ and MQ.59 Both questions were elicited in contexts where the questioner is surprised to discover that the person

59 See Dialogue 11 and Dialogue 12 in Appendix I for the contexts used to elicit this set of utterances.
under discussion has gone to the first floor to eat at McDonald's. In the figure, the top line (the solid line) is a series of the mean F0 values measured from the high tone targets of the syllables tā, qù, yī, lóu, mài, dāng, and lǎo. The base line (the dotted line) consists of a series of the mean F0 values measured from the low tone targets of the syllables qù, lóu, mài, and lǎo.

Figure 5.12. Top Lines and Base Lines: Statement Tā qù yīlóu chī mài dāng lǎo (ma) “He went down to the first floor to eat at McDonald's” and Corresponding Echo-UMQ and Echo-MQ

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60 Tone 1 of the syllable yī changes into Tone 4 since it is followed by Tone 2 (i.e., lóu). See section 2.1.1 for a discussion of morphophonemic tone sandhi changes in Mandarin.

61 The F0 taken from the syllable chī is not included in the top line, since the vowel was often produced too short. Nineteen out of thirty-seven subjects produced a devoiced vowel on this syllable in one or more of the three target sentences. (Out of total thirty-nine subjects, two subjects were excluded from this set of utterances since their utterances were not identical to those in the scripted dialogues.)
In Figure 5.12, the two question types have a similar overall intonation pattern. In both the Echo-UMQ and the Echo-MQ, the overall top line is significantly raised, and the overall pitch range becomes expanded. Also, the pitch range increases particularly toward utterance-final position in both question types. As a result, the most expanded pitch range is seen on the last Tone 2 syllable, láo. Importantly, this pitch range expansion pattern is compatible with the patterns shown for the Echo-UMQs earlier in Figures 5.4 through 5.7 (in section 5.2.2).

Comparing the two types of MQs, namely, Echo-MQ and InfoSeek-MQ, the top line of the Echo-MQ (in Figure 5.12) differs noticeably from the corresponding top line of the InfoSeek-MQ (in Figures 5.6 and 5.7 in section 5.2.2, and Figure 5.10 in section 5.2.3). That is, while the overall top line is significantly raised in the case of the Echo-MQ, the top line in the InfoSeek-MQ is considerably lower than that of the corresponding Echo-UMQ.

The intonation patterns of the Echo-UMQ and Echo-MQ suggest two important aspects of the intonational manipulation and pragmatics of echo-questions. First, the overall raised top line and the expanded pitch range are associated with the expression of such pragmatic meanings as incredulity and surprise in echo-questions in Mandarin. Second, the pitch range may become expanded to the greatest extent over the part of the utterance that is being echoed in a given discourse context. In the case of the two questions examined in Figure 5.12, the speaker is surprised to discover that the person under discussion went to McDonald's. Either the questioner did not know that a new McDonald's opened on the first floor (in the Echo-MQ), or else they originally planned to go to eat hotpot rather than eating at McDonald's (in the Echo-UMQ).

Comparing the intonation patterns of the UMQ and MQ in Echo-questions, the overall pitch range appears to become expanded to a greater extent in the UMQ than in the MQ. In
particular, the rising contour on the last Tone 2 syllable, lāo, is more exaggerated in the UMQ in Figure 5.12. Given the above observations, the global pitch patterns of the Echo-UMQ and Echo-MQ can be schematized as in Figure 5.13 below:

![Figure 5.13. Schematized Global Pitch Patterns of Echo-UMQs and Echo-MQs](image)

The observations made so far in sections 5.2.2 through 5.2.4 appear to support the contention that both pragmatics and syntax interact with the intonation patterns of yes-no questions. More specifically, the pitch range expansion appears to be closely associated with the echo-question that expresses a speaker's surprise or incredulity. At the same time, the overall top line seems to become raised more in UMQs than it does in MQs when both are produced for comparable pragmatic functions. This can be seen in comparing the InfoSeek-UMQ and InfoSeek-MQ pair presented in Figure 5.10 (in section 5.2.3) and the Echo-UMQ and Echo-MQ pair shown in Figure 5.12 (in section 5.2.4). To substantiate these observations, we turn to the last pair, the InfoSeek-UMQ and Echo-MQ, in the following section.
5.2.5 InfoSeek-UMQ and Echo-MQ

No pairs involving an InfoSeek-UMQ and an Echo-MQ were included in the target utterances recorded for the present study. However, two sets of utterances recorded in Lee (2000) can be used to illustrate the intonational differences between these two types of questions. Figure 5.14 first compares three utterances produced by one female speaker: the five-syllable statement *Nîmen mài yángròu* "You (pl.) are selling mutton" and the corresponding two types of MQ. The two MQs differ from each other in that one was elicited as an *out-of-the-blue* question and the other was elicited as an echo-question that expresses the speaker's surprise about the listener selling *mutton*. Therefore, a comparison between these two MQs highlights the intonational differences between the MQs of different pragmatic functions. In the figure, the thin plain line represents the pitch contour of the statement, while the thick plain line shows that of the *out-of-the-blue* MQ. The dotted line represents the pitch contour of the echo-MQ.

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62 In the figure, segmentation is based on the statement. The waveform also corresponds to the statement.
In the set of utterances shown in Figure 5.14, there is not much difference in the overall pitch height between the statement and InfoSeek-MQ (see the thin plain line and thick plain line). However, a notable difference can be observed between the pitch contour of the Echo-MQ and that of the InfoSeek-MQ: not only is the overall pitch realized considerably higher in the Echo-MQ, but its pitch range also becomes more greatly expanded. Furthermore, the overall intonation pattern clearly shows a rising trend in the Echo-MQ. These intonation patterns confirm the patterns found in the InfoSeek-MQs in section 5.2.2 and the Echo-MQs in section 5.2.4.

Figure 5.15 compares the Echo-MQ shown in Figure 5.14 with the corresponding InfoSeek-UMQ, which was elicited as an out-of-the-blue yes-no question. Note that the InfoSeek-UMQ is realized with a wider pitch range than the InfoSeek-MQ, particularly toward the end of
the utterance (see section 5.2.3). A question then arises as to how questioning in the InfoSeek-UMQ and the expression of the pragmatic meaning of surprise in the Echo-MQ are realized using the same acoustic cues, namely, pitch range expansion and top line raising. Figure 5.15 presents the overlaid pitch contours of the Echo-MQ and InfoSeek-UMQ produced by a female speaker. For a better comparison, the InfoSeek-MQ, which is also shown in Figure 5.14, is included in this figure. As labeled in Figure 5.15, the plain thin line is the InfoSeek-MQ, the plain thick line the InfoSeek-UMQ, and the dotted thin line the Echo-MQ.63

![Figure 5.15. Overlaid Pitch Contours: InfoSeek-MQ and Echo-MQ](image)

Figure 5.15. Overlaid Pitch Contours: InfoSeek-MQ and Echo-MQ *Nímen mài yángròu ma?* "Are you (pl.) selling mutton?" and Corresponding InfoSeek-UMQ

The InfoSeek-UMQ is realized with a slightly higher overall pitch in comparison with the InfoSeek-MQ, and the raising of pitch becomes more noticeable in the later part of the utterance in the InfoSeek-UMQ. This is compatible with the patterns shown in section 5.2.3 in that the overall rising trend is realized more clearly in the InfoSeek-UMQ than in the InfoSeek-MQ.

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63 The waveform and the segmentation were done based on the Info-MQ (the thin plain line).
As shown earlier in section 5.2.4, the Echo-MQ that expresses a speaker's surprise is produced with significantly expanded pitch range as well as an overall rising trend in the intonation. Note that the overall rising trend in the intonational contour and the pitch range expansion in the Echo-MQ are much more salient than the corresponding phenomena in the InfoSeek-UMQ. The patterns shown in Figure 5.15 further confirm the claim here that it is not simply syntax (i.e., the presence vs. the absence of a syntactic marker) which is having an effect, but rather that syntax and pragmatics (i.e., InfoSeek vs. Echo) interact together to affect the intonation patterns of yes-no questions. The global pitch patterns of the Echo-UMQ and Info-MQ can be schematized as in Figure 5.16 below:

[Figure 5.16. Schematized Global Pitch Patterns of InfoSeek-UMQs and Echo-MQs]

5.3 Summary and Discussion

The intonational contours presented in sections 5.2.2 through 5.2.5 show that the intonation patterns of the two types of yes-no questions (UMQ and MQ) are realized in close connection with both syntax and pragmatics. This finding refutes earlier studies that draw conclusions based solely on the intonation patterns in certain syntactic question types, such as the ma-particle question, and ignore the role of pragmatics. It also refutes early claims that intonational
manipulation occurs only on the syntactically-unmarked question. Rather, this chapter demonstrates that both syntax and pragmatics contribute to the formation of intonational patterns in yes-no questions, and that syntax and pragmatics affect the prosody of questions in a systematic way.

First, the raised top line in yes-no questions observed in previous studies reflects both expanded pitch range and an overall rising trend in the intonation, and these can be attributed to both pragmatic and syntactic motivations. Regarding pragmatics, the pitch range becomes expanded substantially in both UMQ and MQ when the question is uttered to express a speaker's surprise or incredulity by echoing the previously uttered statement. Therefore, it can be concluded that the expanded pitch range is associated with certain pragmatic functions of yes-no questions and not with a specific syntactically-based sentence type.

Second, InfoSeek-questions are also produced with a wider pitch range in comparison with the corresponding statements. However, the pitch range expansion and the top line raising in InfoSeek-questions are executed to a smaller degree in comparison with those in the corresponding Echo-questions. The resemblance of the intonational patterns in InfoSeek-UMQs and InfoSeek-MQs further confirms that the pragmatics of questions interact with the formation of the intonational patterns.

Third, a comparison between UMQs and MQs that have comparable pragmatic functions shows that the pitch range of the UMQ becomes wider than that of the corresponding MQ, particularly toward utterance-final position. This suggests that the intonational cues may be produced more markedly in the absence of a syntactic cue.

Lastly, the pitch range increases to the greatest extent toward utterance-final position in all four types of yes-no questions examined in this study (i.e., InfoSeek-UMQ, InfoSeek-MQ,
Echo-UMQ, and Echo-MQ). This appears to suggest two prosodic motivations that represent different prosodic levels: one may represent the global rising pitch trend associated with a yes-no question, and the other may be attributable to a more localized F0 raising cue realized at utterance-final position. (The latter motivation will be discussed in great detail in Chapter 6.)

Figure 5.17 schematizes the global pitch patterns of yes-no questions and those of the corresponding statements observed in this chapter. It shows that the overall pitch range becomes expanded to a different degree in interaction with the pragmatic function as well as with the syntax of the question.

<table>
<thead>
<tr>
<th>Question Type</th>
<th>Schematized Representation of Global F0 Patterns in Yes-No Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>InfoSeek-Question</td>
<td><img src="image1" alt="Diagram of InfoSeek-Question" /></td>
</tr>
<tr>
<td>Echo-Question</td>
<td><img src="image2" alt="Diagram of Echo-Question" /></td>
</tr>
</tbody>
</table>

Figure 5.17. Schematized Global Pitch Patterns of Yes-No Questions

The findings presented in this chapter reject Hypotheses A and C (in section 5.2.1) since neither of them predicts a raising of the top line towards the end of the utterance in yes-no questions. This leaves Hypotheses B and D. What still needs to be understood then is whether pitch range
gradually expands over the utterance (Hypothesis B) or whether there is a notable increase in F0 that is realized over a certain region (e.g., the final portion) of the utterance (Hypothesis D). This issue is addressed in Chapter 6, together with other issues pertaining to localized F0 manipulations in questions.
CHAPTER 6

RESULT II: LOCAL PITCH MANIPULATIONS IN YES-NO QUESTIONS

The global pitch patterns of yes-questions discussed in Chapter 5 show that the pitch range increases to the greatest extent toward utterance-final position. Furthermore, this pattern occurs in all four question types examined in the chapter, InfoSeek-UMQ, InfoSeek-MQ, Echo-UMQ, and Echo-MQ. This leads us to consider the possibility that a more localized F0 raising is crucial in yes-no question intonation. In fact, a terminal rise, one in which influence is localized over the last syllable(s), has been viewed as a crucial acoustic cue for differentiating questions from statements in much of the literature (see section 3.1.1 for a detailed review of early studies).

This chapter discusses a more localized pitch raising cue and its interaction with more global pitch manipulations in yes-no questions. Section 6.1 presents the terminal rise and its domain in yes-no questions, and section 6.2 discusses the interaction between the localized rise and lexical tone, in particular, Tone 3. A summary and discussion follow in section 6.3.

6.1 Local F0 Effect: Terminal Rise and Its Domain

Many previous studies agreed that a terminal rise is a crucial cue in signalling questions. In fact, terminal rise has also been found to be important in perception (Gussenhoven and Chen 2000,
Yuan 2004, see section 3.1.1 for a detailed literature review). What is in dispute is the domain for
the localized F0 rise. Section 6.1.1 provides a schematized representation of the hypotheses
proposed in the earlier literature, while section 6.1.2 discusses the domain for a localized pitch
rise in the two types of yes-no questions that are explored in this study.

6.1.1 Hypotheses

The dispute over the domain of the localized F0 rise can be categorized into four hypotheses
regarding where the terminal rise is anchored in yes-no questions. More specifically, the last
syllable, the last full-toned (stressed) syllable, and the last word have been proposed as the
primary domain for the local F0 effects. Given that the top line in yes-no questions is produced
higher with an overall rising trend (see Chapter 5), the hypotheses regarding the terminal rise in
questions can be schematized as follows, with statements included for comparison.64

64 The schematized representation of the hypotheses is mine.
Hypothesis | Schematized Representation of Hypothesis
--- | ---
Hypothesis I. Localized Rise on the Last Syllable | ![Diagram 1](image1.png)
Hypothesis II. Localized Rise on the Last Stressed Syllable | ![Diagram 2](image2.png)
Hypothesis III. Localized Rise on the Last Word | ![Diagram 3](image3.png)
Hypothesis IV. No Localized Rise | ![Diagram 4](image4.png)

Figure 6.1. Schematized Intonational Patterns with a Terminal Rise in Questions

Of the four hypotheses, Hypothesis I has been widely accepted in earlier studies. It posits the localized F0 rise as being realized on the last syllable regardless of the stress type of the syllable. Hypothesis I therefore predicts that the crucial local rise is realized on the *ma*-particle in the case of MQs. Hypotheses II and III both predict that the localized F0 rise can be realized over more than one syllable. Where they differ from each other is that Hypothesis II predicts that the localized F0 rise would start on the last full-toned (stressed) syllable, whereas Hypothesis III predicts that the rise would be realized over the utterance-final word. When the last syllable is a stressed (full-toned) syllable, Hypotheses I and II essentially make the same prediction. On the other hand, Hypotheses II and III make the same prediction when the second syllable in the utterance-final disyllabic word is neutral-toned.
Unlike Hypotheses I through III, Hypothesis IV posits no local rising cue. Rather, it treats the raised pitch toward utterance-final position as simply part of the overall gradual rising trend in the intonational contour across the utterance. On that analysis, while the F0 difference between a question and a statement increases towards the end, listeners tend to perceive the rising trend as if there is only a local rise at the end. Given the four potential hypotheses, the domain of the terminal F0 rise will be examined further in the next section.

6.1.2 Terminal Rise Domain

To understand the domain for the terminal rise in yes-no questions in relation to both syntax and pragmatics, it is necessary to examine the two question types – UMQ and MQ – that convey comparable pragmatic meanings – InfoSeek vs. Echo. This enables us to distinguish the interaction between the terminal rise and syntax from the interaction between the terminal rise and pragmatics. For this reason, section 6.1.2.1 first explores the realization of the terminal rise in InfoSeek-UMQs and InfoSeek-MQs, and section 6.1.2.2 examines Echo-UMQs and Echo-MQs.

6.1.2.1 InfoSeek-UMQ and InfoSeek-MQ

An ideal set of utterances where we can examine the localized terminal rise in yes-no questions is the nine-syllable statement Lì xiānshēng jīntiān zài bàngōngshì/shí "Mr. Li is in the/his office today" and its corresponding InfoSeek-UMQ and InfoSeek-MQ. In both questions, the speaker asks for information about the location, specifically, whether if Mr. Li is in the office or not.65

65 See Dialogue 13 in Appendix I for the contexts used to elicit this set of utterances.
In this set of utterances, the last syllable is produced with either Tone 3 mercial rise is realized in yes-no questions in a consistent way, we expect to see compatible intonation patterns regardless of the lexical tone type on the last syllable. The utterances produced with the Tone 4 syllable are presented in Figure 6.2, and those produced with the Tone 3 syllable are shown in Figure 6.3. In both figures, the top line (the solid line) is a sequence of the high tone targets measured from the syllables xiān, jīn, tiān, zài, bàn, gōng, and shì/shī. The base line (the dotted line) is a sequence of the low tone targets of the syllables lǐ, zài, bàn, and shì/shī.

Figure 6.2. Top Lines and Base Lines: Statement Lǐ xiān shēng jīn tiān zài bàn gōng shì (ma).
In Figure 6.2, the top lines are raised throughout the utterance in both the UMQ and the MQ. As indicated by the horizontal bracket in the figure, however, the F0 differences among the top lines increase substantially over the later portion of the utterance in both question types. The pitch range also becomes expanded over the same domain. This shows that although the most F0 raising in the question is realized on the last syllable, the domain for the terminal rise is certainly larger than a syllable unit. More importantly, the domain for the terminal rise corresponds to the last three points in the top line, which is the last word bàngōngshì "office". Also note that the local rise is realized more saliently in the InfoSeek-UMQ than in the InfoSeek-MQ. To see if we can find similar patterns in the other set of the utterances with Tone 3 on the last syllable, we need to turn to Figure 6.3.
Figure 6.3. Top Lines and Base Lines: Statement  "Mr. Li is in the/his office today" and Corresponding InfoSeek-UMQ and InfoSeek-MQ

Strikingly similar intonation trends can be observed in Figure 6.2 and Figure 6.3. As in Figure 6.2, Figure 6.3 also shows that the increasing F0 differences are seen over the last three points in the top line, i.e., the last word "office". The pitch range differences also increase over the same domain. This resemblance between Figure 6.2 and Figure 6.3 suggests that regardless of the tone type of the last syllable, the F0 rise toward the end of the utterance in both types of yes-no questions is realized in association with a larger unit which conveys what is being asked by a questioner in a given context.
It is also evident that the most increased pitch range is realized not on the last syllable shǐ but on the preceding high-level syllable gōng in the UMQ in Figure 6.3. This differs from the set shown in Figure 6.2 in which the most expanded pitch range is realized on the last high-falling syllable shì in the UMQ. It appears to show that when a Tone 3 syllable is the final full-toned syllable in a yes-no question, the largest expansion of pitch range is realized not on the final Tone 3 syllable but on its immediately preceding high tone target. (The interaction between the utterance-final Tone 3 syllable and the terminal rise will be further discussed later in section 6.2.)

To further investigate the domain for the localized terminal rise in yes-no questions, we need to examine pitch patterns realized over a domain that has a different syntactic structure. Figure 6.4 presents the statement Niángāo zhēng wūfēnzhōng "(You) steam the rice cake for five minutes" and the corresponding InfoSeek-MQ. In the MQ, the questioner asks how long s/he needs to steam the rice cake, that is, whether it should be five minutes (wūfēnzhōng) or not. While bàngōngshí/shì "office" (in Figures 6.2 and 6.3) is a noun, wūfēnzhōng "five minutes" is a noun phrase (wū-fēnzhōng; five-minute). In the figure, the top line (the solid line) consists of the mean F0 values from the high tone targets in the syllables nián, gāo, zhēng, fēn, and zhōng. And the base line (the dotted line) consists of the mean F0 values from the low tone targets in the two syllables nián and wū.

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66 Since the corresponding UMQ is an Echo-question, it is not included in the figure.
67 See Dialogues 14 and 15 in Appendix I for the contexts used to elicit this set of utterances.
It can immediately be seen that the top line in the MQ is raised most conspicuously over the two points indicated by the two arrows in Figure 6.4. However, it can also be observed that the pitch range difference between the two utterance types increases substantially over the last three points, the last point in the base line and the last two points in the top line, as indicated by the horizontal bracket in the figure. The increase in the pitch range difference between the two utterance types can be seen by comparing the difference between S1 and MQ1 with the difference between S2 and MQ2.

Importantly, the domain over which the pitch range difference is manifested to the greatest extent corresponds to "five minutes", which also corresponds to what the
questioner inquires about in the context. This further suggests that the domain for the localized F0
cues at utterance-final position can correspond to a syntactic constituent (i.e., an NP in this case)
rather than a syllable unit.

6.1.2.2 Echo-UMQ and Echo-MQ

As presented in section 6.1.2.1, the substantially raised top line and expanded pitch range are
realized over a syntactic constituent at utterance-final position in InfoSeek-questions. This section
examines whether the localized cues are realized in Echo-questions in the same manner. Recall
that Echo-questions are characterized by an overall expanded pitch range and that the top line is
raised notably from the beginning of the utterance (as discussed in sections 5.2.2 and 5.2.4). The
question then is whether or not the F0 difference between the top line of the statement and that of
the Echo-question would still increase significantly over a syntactic constituent at utterance-final
position. The intonation patterns are displayed in Figure 6.5 to help us answer this question.

Figure 6.5 reproduces the set of utterances shown in Figure 5.10 (section 5.3.4): the set of
corresponding to the eight-syllable statement Tā qù yīlóu chī màidāngláo “He/she went down to
the first floor to eat at McDonald's” and the corresponding Echo-UMQ and Echo-MQ. Both
questions were produced in so that the speaker expresses his/her surprise about the person under
discussion having gone to McDonald's. As a result, the last word carries the important question
information. In the figure, the top line (the solid line) is a series of the high tone targets measured
from the syllables tā, qù, yī, lóu, mài, dāng, and láo. The base line (the dotted line) consists of a
series of the low tone targets measured from the syllables qù, lóu, mài, and láo.

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68 See Dialogue 11 and Dialogue 12 in Appendix I for the contexts used to elicit this set of utterances.
Figure 6.5. Top Lines and Base Lines: Statement  "He went down to the first floor to eat at McDonald's" and Corresponding Echo-UMQ and Echo-MQ

Figure 6.5 shows that the patterns of the top lines are not identical to those shown in the InfoSeek-questions in Figure 6.2 (in section 6.1.2.1). In the case of the InfoSeek-questions in Figure 6.2, the top lines become significantly raised mainly over the last NP, "office". In contrast, the top lines do not exhibit the sudden rise over the last NP, "McDonald's", as indicated by the horizontal bracket in Figure 6.5. Instead, the pitch range becomes increased significantly over the last NP because the base line does not become raised in the Echo-questions. That is, while both the top line and the base line tend to become raised in the
InfoSeek-questions, only the top line is raised in the Echo-questions. (This is highlighted by the vertical bracket in the figure.) In addition, the raising of the top line is most salient on the last syllable láo in the UMQ.

The patterns observed in Figure 6.5 suggest that what is often perceived as a localized final rise can be realized not just as the raised top line but also as an expanded pitch range. Since the overall top line is raised to express the pragmatic meaning of incredulity or surprise in Echo-questions, the final local cue may employ a substantial expansion of pitch range by not raising the base line.

The next set of utterances presented in Figure 6.6 helps us understand the domain for the localized rise in utterances with a different syntactic construction: the statement Tā zuìjìn zháodào le xīn gōngzuò "He recently got a new job" and its corresponding InfoSeek-UMQ.69 In this set, the syntactic constituent at utterance-final position is an NP, xīn gōngzuò "new job", whereas that in the previous set of utterances is a noun, màiđāngláo "McDonald's". In the figure, the top lines (the solid lines) are composed of the mean F0 values measured from the high tone targets of the syllables tā, zuì, jìn, dào, xīn, gōng, and zuò. The base lines (the dotted lines) consist of the mean F0 values measured from the low tone targets of the syllables zuì, jìn, zhāo, dào, and zuò.

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69 This set of utterances is also shown in Figure 5.6 in section 5.2.2.2. But, since the corresponding MQ is an InfoSeek-question, it is not included in the figure here.
The syllable indicated by the arrow in the figure is *dào*, which is originally a falling tone syllable (Tone 4). However, it usually becomes unstressed in Beijing Mandarin, and the falling contour is not fully realized. However, this syllable is included in the figure for easy comparison of the pitch patterns between the early part of the utterance and the later part of the utterance.

As also seen in Figure 6.5, the top line is noticeably raised from the beginning in the Echo-UMQ and does not seem to be raised over a certain region. (Compare the top line patterns in Figures 6.5 and 6.6 with those in Figures 6.2 and 6.3.) However, as indicated by the brackets in the figure, the pitch range is increased substantially over the later portion of the Echo-UMQ.
(Compare the pitch range patterns over the early part of the utterance, the part before the syllable dào, and those over the later part of the utterance, the part after the syllable dào). More specifically, the domain for the pitch range expansion corresponds to the last NP xīn gōngzuò "new job". This suggests that the pitch range expansion is a crucial component of localized F0 cues in Echo-questions.

Of the four Hypotheses discussed in section 6.1, only Hypothesis III can explain the association between the localized F0 cues and the last syntactic constituent of a question. However, we need to redefine the domain for the localized F0 cues. While Hypothesis III defines the domain as word, the findings of the present study suggest that it is a syntactic constituent (i.e., an NP in the cases examined in the current study).

Nonetheless, the pitch patterns examined in Figures 6.2 through 6.6 also show that the largest pitch range expansion and the greatest top line raising appear on the last syllable. (The seemingly exceptional case, the final rise on the utterance-final Tone 3 syllable in the UMQ in Figure 6.3, will be explained later in section 6.3.) This might indicate that the terminal rise localized on the last syllable is also crucial. To test this possibility, we examine the final rise in other sets of utterances where the syllable at utterance-final position is inherently neutral toned / unstressed. This is discussed in the following section.

6.1.3 Neutral Tone and Terminal Rise

Recall that Hypotheses I, II, III, and IV make different predictions about the interaction between a localized final rise and lexical stress. Hypothesis I differs from Hypotheses II and III in that it predicts the highest pitch to be realized on the last syllable regardless of the stress type of the
syllable. Hypothesis I therefore predicts that the terminal rise in an MQ will be realized on the 
ma-particle, which inherently has a neutral tone. To understand how the localized final rise is 
realized in relation to lexical stress, we need to examine utterances that contain one or more 
neutral tone syllables at utterance-final position. A set of examples is given in Figure 6.7.

Figure 6.7 presents the top lines of a set of three utterances: the statement Fàng zài nèi ge 
hézi lǐbiār le “(She) put (it) in that box” and the corresponding InfoSeek-MQ and InfoSeek-
UMQ. Both the MQ and UMQ are InfoSeek-questions that ask whether she has put the camera in 
that box.\(^{70}\) In the figure, the pitch patterns comprise the mean F0 values measured from the high 
tone targets of the syllables fàng, zài, nèi, hé, and the mid points of the vowels of the neutral tone 
syllables biār and le. In the case of the MQ, a point was also taken from the ma-particle.

\(^{70}\) See Dialogue 16 and Dialogue 17 in Appendix I for the contexts used to elicit this set of utterances.
In addition to the overall raised pitch in both question types, we should focus on the pitch over those syllables enclosed by the circle in Figure 6.7, namely, the last two neutral tone syllables biar and le (i.e., the last two points in the statement and UMQ and the two points preceding the last point - the ma-particle - in the MQ). In the statement, we can see that the pitch on the two consecutive neutral tone syllables falls gradually. By contrast, the pitch rises over the corresponding syllables in both the UMQ and the MQ. In the UMQ, not only does the pitch continue to rise onto the last neutral tone syllable le, but the duration of these syllables also
becomes longer. Nonetheless, the pitch does not continue to rise on the ma-particle in the MQ but falls instead. This pattern contradicts Hypothesis I which predicts the pitch rise on the ma-particle.

Regarding the rising pitch over the neutral tones, particularly in the UMQ, one may surmise that the rising pitch over the final syllables biar and le shows the final rise in yes-no questions. This may seem reasonable, given that no comparable pitch rise is shown on the corresponding neutral tones in the statement. However, note that the syllable preceding these neutral tones is the Tone 3 syllable lî. It is very likely that the rising pitch over the neutral tones is due to the influence of the preceding low tone in the syllable lî.\textsuperscript{71} To better understand this issue, it is necessary to examine a case where another type of tone immediately precedes one or more utterance-final neutral tones.

Figure 6.8 shows the statement Tā zuótiān qù kàn yīshēng le "He went to see a doctor yesterday" and the corresponding InfoSeek-UMQ and InfoSeek-MQ. Both the UMQ and MQ were elicited as InfoSeek questions in the contexts where the questioner asks about whom the person under discussion met yesterday, namely, yīshēng "doctor" in the MQ and Yī Shen "Yi Shen" in the UMQ.\textsuperscript{72} Note that the last full tone syllable is a high tone syllable, shēng, in the statement and MQ. In the UMQ, the word yīshēng "doctor" is replaced with a near-synonym, the proper noun Yī Shēn.\textsuperscript{73} Figure 6.8 presents the top lines of the three utterance types. Each top line consists of the mean F0 values from the high tone targets of the syllables tā, zuó, tiān, qù, kàn, yī, and shēng, and the mid point of the vowel of the neutral tone syllable le. In the MQ, an additional point was taken from the ma-particle.

\textsuperscript{71} When a neutral tone syllable immediately follows a Tone 3 syllable, the pitch on the neutral tone syllable is realized as "half high" ("4" in Chao's numerical scale). See section 2.1 for the tonal realization of neutral tone syllables.

\textsuperscript{72} See Dialogue 18 and Dialogue 19 in Appendix I for the contexts used to elicit this set of utterances.
In addition to the overall higher pitch in both the UMQ and the MQ, the pitch over the last word (yīshēng / Yī Shēn "doctor / Yi Shen", which is indicated by the horizontal bracket in the figure) is considerably higher than that in the statement. Furthermore, while both syllables of the last words have a high level tone, the pitch is raised over the second syllable in both the UMQ and the MQ. As a result, the biggest F0 differences among the three utterance types appear on the second syllable of the word. This may show a rising pitch trend realized in the two question types.

Figure 6.8. Top Lines: Statement Tā zuótiān qù kàn yīshēng le "He went to see a doctor yesterday" and Corresponding InfoSeek-MQ, and InfoSeek-UMQ Tā zuótiān qù kàn Yī Shēn le? "He went to see Yi Shen yesterday?"

73 The replacement was made to prevent the participants from recognizing the target utterances in dialogues.
However, as indicated by the components enclosed within the circle in the figure, the pitch drops on the neutral tone syllable le (PRT) in all three utterance types. Interestingly, the pitch on the last syllable lowers to a greater extent in the UMQ than it does in the statement. Also, as the pitch becomes lower on the syllable le, it also continues to fall on the ma-particle in the MQ.

The pitch patterns shown in Figure 6.8 therefore refute Hypothesis I, which predicts pitch raising on the last neutral tone syllable. On the other hand, the fact that the biggest F0 raising is realized on the last stressed-syllable Shēn / shēng in both question types does not necessarily indicate that the last stressed syllable is associated with the final rise (as predicted by Hypothesis II). Although the biggest pitch differences among the three utterance types is shown on the last stressed syllable, pitch raising is manifested over a larger domain, which corresponds to an NP in this case.

The findings presented so far in this chapter show that what is often described as a terminal rise in questions may be an expanded pitch range that is more localized toward the end of an utterance. In particular, the localized F0 pitch range expansion is manifested primarily over the last NP in the two yes-no question types. Therefore, the final rise does not appear to be associated with a syllable unit. Rather, the domain for the localized F0 cues may correspond to a syntactic constituent which conveys the most important question information in a given discourse context. This is further supported by the F0 patterns found on the utterance-final neutral tone syllable.

Another important question pertains to localized pitch manipulation with regard to lexical tone type, particularly a low tone (Tone 3). Recall that peak values vary widely, while low values
vary only slightly (see section 2.1.2). The issue, then, is how the pitch range expansion is realized when a Tone 3 syllable is in utterance-final position. This issue is discussed in the following section.

6.2 Tone 3 and Terminal Rise

As mentioned in section 2.1.1, the pitch contour of Tone 3 ("214" in Chao's numerical system) is realized in three distinct surface forms: a low-dipping tone ("214"), a low-rising tone ("14"), and a low tone ("21"). In Beijing Mandarin, Tone 3 is commonly realized as a low tone ("21") at utterance-final position in statements. A question then arises as to how pitch range expansion is realized when the last syllable is a Tone 3 syllable in yes-no questions. This question is addressed in section 6.2.1.

Another question pertaining to the final Tone 3 in yes-no questions is related to creaky voice production. Due to the low pitch, a Tone 3 syllable is often produced with a creaky vowel quality. The question that needs to be answered is whether or not the terminal rise affects creaky voice production on Tone 3 syllables in questions. This question is explored in section 6.2.2.

6.2.1 Tone 3 and Pitch Range Expansion

With regard to how a localized pitch range expansion is realized over the utterance-final low-toned (Tone 3) syllable, more than one possibility can be considered. The first possibility is that
the rising contour of Tone 3 ("14" of "214"), which is not normally realized in statements, is realized in questions. The second possibility is that pitch range expansion and top line raising are realized primarily on the immediately preceding high tone.

Figure 6.9 presents the top lines and base lines of a set of three utterance types: the statement  

\[\text{Tāmen xiàwù yào qù yóuyòngguān "They are going to go to a swimming pool in the afternoon" and the corresponding MQ and UMQ.} \]

Both the MQ and UMQ are InfoSeek-questions that were produced so that the questioner is inquiring about the place where they are going in the afternoon, the yóuyòngguān "swimming pool". In the figure, the top line (the solid line) is a series of the mean F0 values measured from the high tone targets taken from the syllables tā, xià, yào, qù, yòng, and guān.\(^75\) In the case of the MQ, the last high tone was measured not from guān but from the ma-particle.\(^76\) The base line (the dotted line) consists of the mean F0 values measured from the low tone targets taken from the syllables wū, yào, qù, yóu, and guān.

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\(^74\) See Dialogue 20 and Dialogue 21 in Appendix I for the contexts used to elicit this set of utterances.

\(^75\) In the word yóuyòngguān "swimming pool", the second syllable is pronounced as Tone 1. Since the second syllable yòng is followed by another Tone 3 syllable guān, it becomes Tone 2. Then, since Tone 2 becomes Tone 1 in a weak stress position, it becomes yǒng (Chao, 1968). As a result, the high tone target of yǒu is the same as that of yǒng. Thus, the F0 value that represents H was measured from the intersection between these two syllables. (See section 2.1.1 for a discussion of tone sandhi.)

\(^76\) Since the pitch contour continues to rise onto the ma-particle, the highest pitch is realized not on the dipping tone syllable guān but on the ma-particle. Therefore, the high pitch value was measured from the ma-particle.
Figure 6.9. Top Lines and Base Lines: Tāmen xiàwù yào qù yóuyòngguān "They are going to go to a swimming pool in the afternoon" and Corresponding InfoSeek-MQ and InfoSeek-UMQ

The global pitch patterns of both the UMQ and MQ in Figure 6.9 are consistent with the patterns of the InfoSeek-questions examined earlier (section 5.2.3): the overall pitch height and range between the two question types are very similar over the early part of the utterance. Moreover, the pitch range expansion and top line raising take place primarily over the last NP yóuyòngguān "swimming pool".

Note that in the UMQ, the pitch range and top line raising become most salient not on the terminal syllable guān but on the preterminal syllable yòng, which is pronounced as a high tone.
due to tone sandhi changes (see Footnote 75). Comparing the UMQ and the MQ, the pitch at the very end of the utterance in the UMQ is slightly lower than that at the end of the MQ. As indicated by the bracket in the figure, the terminal rising pitch in the MQ (the pitch across guăn and the ma-particle) is realized to a greater extent than that in the UMQ (the pitch on guăn). By contrast, the rising contour is not seen on the last syllable in the statement. As indicated by the arrow in the figure, there is no pitch difference between the low tone and the high tone in the syllable (guăn). This indicates that Tone 3 tends to be realized as a low tone ("21") in the statement and as a low-dipping tone ("214") in both the MQ and the UMQ.

Another set of utterances consists of Tā xīhuān chī huāshēngmĭ "S/He likes eating peanuts" and its corresponding InfoSeek-MQ and Echo-UMQ. In Figure 6.10, the top line (the solid line) is a series of the mean F0 values measured from the high tone targets taken from the syllables tā, chī, huā, shēng, and mĭ. In the case of the MQ, the last high tone target was not from mĭ but from the ma-particle.77 The base line (the dotted line) is composed of the mean F0 values from the low tone targets taken from two syllables xī and mĭ.

77 Since the pitch contour continues to rise onto the ma-particle, the highest pitch is realized not on the dipping tone syllable mĭ but on the ma-particle. Therefore, the high pitch value was measured from the ma-particle.
In the set of utterances in Figure 6.10, the MQ and the UMQ differ from each other in terms of pragmatic functions. The MQ was elicited as an InfoSeek question in which the last word "huāshēngmǐ "peanuts" is what the questioner was asking about. In contrast, the UMQ was produced as an Echo-question in which the speaker expresses surprise about the fact that she likes to eat peanuts." 78 As also seen in the sets of Echo-UMQs and InfoSeek-MQs in Figures 5.4

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78 See Dialogue 22 and Dialogue 23 in Appendix I for the contexts used to elicit this set of utterances.
through 5.7 (section 5.2.2), the overall pitch range is expanded from the beginning of the utterance in the Echo-UMQ, whereas the pitch range of the InfoSeek-MQ is approximately between those of the Echo-UMQ and the statement.

As for the pitch over the last word *huāshēngmí* "peanut", the pitch on the syllable "*shēng" is significantly raised in the UMQ. On the other hand, the pitch on the last syllable "*mǐ" does not rise in the UMQ as much as it does over the low tone of "*mǐ" and the *ma-*particle in the MQ. (Compare the two brackets in the figure.) In contrast to the rising contour realized at utterance-final position in both question types, no rising contour is seen in the statement, as indicated by the arrow in the figure. This again shows that Tone 3 is realized as a low tone ("21") in the statement whereas it tends to be realized as a low-dipping tone ("214") in both the MQ and the UMQ.

The intonational patterns presented in Figures 6.9 and 6.10 show that an utterance-final Tone 3 syllable tends to be realized as a dipping-tone ("214") in the two types of yes-no questions but it is produced as a low tone ("21") in statements. While the rising portion of the Tone 3 contour ("14" out of "214") is realized in both the UMQ and the MQ, it is realized higher in the MQ. This may be due to the durational difference caused by the additional syllable (i.e., the *ma-*particle) in the MQ. Furthermore, the pitch range expansion is realized to the greatest extent on the high tone immediately preceding the utterance-final Tone 3 syllable in the UMQ.

### 6.2.2 Tone 3 and Creaky Voice

As noted earlier, Tone 3 syllables are often produced with creaky voice due to the low pitch realized on the syllables in the portion of "21". Creakiness is particularly prevalent in spontaneous speech. This provides another condition in which we can examine both the terminal
rise and the role of the *ma*-particle in the terminal rise in yes-no questions. More specifically, if the pitch rise in utterance-final position is important in yes-no questions, we expect creaky voice to be produced less frequently in questions. Moreover, if the *ma*-particle functions as an independent prosodic unit that bears a terminal F0 rise, it is expected to serve as the association site for the higher target at the end of the "214" contour of Tone 3. Therefore, we predict that creaky voice is not produced over the *ma*-particle.

Figure 6.11 presents the percentage of creaky voice produced over the utterance-final Tone 3 syllable in the utterances shown in Figure 6.9 (the statement *Tāmen xiàwú yào qù yóuyǒngguān* "They are going to a swimming pool in the afternoon" and its corresponding MQ and UMQ). The lowest F0 point ("guan3L") and the highest F0 point ("guan3H") of the syllable are examined in both the statement and the UMQ. In the MQ, three points - the lowest F0 point ("guan3L"), the beginning point of the *ma*-particle, and the end of the *ma*-particle - are examined.
Figure 6.11. Percentage of Creaky Voice Productions on the Final Tone 3 Syllable in *yóuyòngguān* in Statements, UMQs, and MQs

Figure 6.11 shows that creaky voice is produced most frequently on the low tone target point of the final Tone 3 syllable in the statement (i.e., a relative frequency of 92%). Interestingly, although creaky voice is produced less frequently on the high tone target point of the syllable in the statement, the frequency of its occurrence is still as high as 62%. This confirms that the utterance-final Tone 3 syllable tends to be realized as a low tone ("21") in the statement. In the case of the UMQ, creaky voice is produced on the low tone target point of the utterance-final Tone 3 syllable at the lower frequency of 44%, and the occurrence of creaky voice decreases significantly on the high tone target point (i.e., a relative frequency of 10%). This shows that not only is the overall pitch on the final Tone 3 syllable higher, but a rising contour is also frequently realized at the final position in the UMQ.
The creaky voice production pattern in the MQ is particularly interesting. Creaky voice is produced on the low tone target point of the final Tone 3 syllable at a frequency of 46% in the MQ. However, it occurs considerably more often at the beginning point of the ma-particle at a frequency of 77%). At the end point of the ma-particle, no occurrences of creaky voice were found. This pattern indicates that the low tone target is in fact realized not on the final Tone 3 syllable but on the early portion of the ma-particle.

Figure 6.12 presents the percentage of creaky voice produced over the utterance-final Tone 3 syllable in another set of utterances (the statement Tā xiān chī huāshēngmí "S/He likes eating peanuts" and its corresponding MQ and UMQ from Figure 6.10). The low tone target point ("mi3L") and the high tone target point ("mi3H") of the syllable are examined in both the statement and the UMQ. In the MQ, three points - the lowest F0 point ("mi3L"), the beginning point of the ma-particle, and the end of the ma-particle - are examined.
Figure 6.12 shows patterns similar to those observed in Figure 6.11. Creaky voice is produced most often at the low tone target point of the utterance-final Tone 3 syllable in the statement (i.e., a relative frequency of 56%). On the high tone target point of the syllable, creaky voice still occurs at a frequency as high as 54%. This confirms that a final Tone 3 is often realized as a low tone ("21") in the statement. In the UMQ, although creaky voice is produced on the low tone target point of the syllable about a half of the time (i.e., a frequency of 51%), its occurrence at the high tone target point decreases to 10%. This pattern again reveals that the pitch on the utterance-final Tone 3 accompanies the rising contour in the UMQ.

The pattern of creaky voice production in the MQ shown in Figure 6.12 is also compatible with the pattern shown in Figure 6.11. Creaky voice is produced at the low tone target point of the utterance-final Tone 3 syllable at a relatively low frequency of 18%, but it occurs
most often at the beginning of the *ma*-particle (i.e., a frequency of 51%). At the end of the *ma*-particle, no occurrences are observed. As also shown in Figure 6.11, the lowest pitch is realized not on the final Tone 3 syllable but on the early portion of the *ma*-particle.

The observation that the lowest pitch is realized not on the final Tone 3 syllable but on the early part of the *ma*-particle indicates that the *ma*-particle does not stand as an independent prosodic unit that could bear the terminal rise in MQs. Rather, it is cliticized onto the preceding full-toned syllable and forms part of the preceding prosodic unit. Therefore, the terminal rise in MQs needs to be viewed as a raised pitch contour over the prosodic unit followed by the *ma*-particle.

### 6.3 Summary and Discussion

In this chapter, we examined the localized F0 manipulations in yes-no questions and found that the expansion of pitch range and raising of the top line are manifested towards utterance-final position. While the greatest amount of top line raising appears on the last stressed syllable, the raising of the top line, as well as the expansion of pitch range, are performed across a domain larger than a syllable unit. This contradicts the claim that the localized pitch rise is realized on a particular syllable, such as the last syllable or the last stressed syllable. Hence, the results here refute Hypotheses I and II in section 6.1.1. The F0 patterns observed in this chapter further suggest that the domain for the localized pitch manipulations is associated with a syntactic unit. More specifically, the domain appears to correspond to the utterance-final NP which conveys the most crucial question information in a given context.
Examination of the F0 patterns on utterance-final Tone 3 syllables also shows the interaction between localized F0 manipulations and lexical tone types. In particular, although the utterance-final Tone 3 syllable is normally pronounced as a low tone ("21") in statements, it tends to be realized as a dipping tone ("214") in yes-no questions. Along with the rising contour, the highest top line appears on the high tone immediately preceding the utterance-final Tone 3 syllable in UMQs. In addition, the observation that the lowest tone with creaky voice is realized not on the final Tone 3 syllable but on the early part of the ma-particle indicates that the ma-particle does not stand as an independent prosodic unit that bears the terminal rise in MQs. Rather, it appears to form a prosodic unit with its preceding syntactic unit (i.e., an NP).

The findings in this chapter further suggest that the localized final rise is manifested in interaction with global pitch patterns. As discussed in Chapter 5, the top line tends to be raised significantly in Echo-questions which involve a speaker expressing the pragmatic meaning of surprise or incredulity. This differs from InfoSeek-questions, where the raising of the top line is manifested primarily over the last NP in the utterance. In Echo-questions, the top line rises by itself, whereas both the top line and the base line rise in InfoSeek-questions. This indicates that not only is raising of the top line important, the expansion of pitch range is also a crucial component of the localized F0 cues in yes-no questions. Both global and localized pitch patterns in yes-no questions can be schematized as in Figure 6.13, where the solid line represents the question. The dotted line, representing the statement, is included for comparison.
<table>
<thead>
<tr>
<th>Question Type</th>
<th>Schematized Representation of Global and Localized F0 Patterns in Yes-No Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>InfoSeek-Question</td>
<td>![Schematized Representation of InfoSeek-Question]</td>
</tr>
<tr>
<td>Echo-Question</td>
<td>![Schematized Representation of Echo-Question]</td>
</tr>
</tbody>
</table>

Figure 6.13. Schematized Representation of Global and Localized F0 Patterns in Yes-No Questions

As for the domain for the localized F0 manipulations in yes-no questions, the present study identifies it as the last NP of an utterance. This differs from Hypothesis III which defines the domain as the last word. However, further research is needed to determine if the domain can correspond to other syntactic constituents, such as VPs, and how the domain may change in relation to discourse contexts. Given that the discourse contexts used to elicit the utterances in this study were designed so that the utterance-final NP often conveys crucial question information, we need to explore questions elicited in different discourse contexts.

Another issue that needs to be explored concerns how the domain for the localized rise found in this study is related to the prosodic domain for such prosodic phenomena as tone sandhi changes and stress assignment. The issue of whether the domain for the terminal rise is related to the rhythmic unit that has been posited as a "phonological phrase" or "superfoot" in Mandarin (Shih 1986, 1997) awaits future study.
CHAPTER 7

RESULT III: STRESS AND QUESTION INTONATION

In Mandarin, some morphemes, such as the particles ba, ma and a, and the nominal suffix zi, are intrinsically unspecified for lexical tone and therefore unstressed. In addition to the lack of stress on inherently neutral tone syllables, weak stress occurs at the phrase level, such as weak stress on the negation marker bù "not" and the second verb in the V-not-V interrogative construction (e.g., lái bù lái (come-not-come) "Will (you) come?"). It has been observed that the unstressed (neutral tone) syllable occurs more frequently in Beijing Mandarin than in the other varieties of Chinese (Chao 1968: 38-39). Furthermore, stress is also realized at the sentence level in relation to pragmatic narrow focus (see section 2.2 for the F0 representation of sentential stress).

This chapter discusses how question intonation interacts with stress at different linguistic levels in Beijing Mandarin. Section 7.1 first discusses stress at a lower level in relation to question intonation, and section 7.2 proceeds to examine how sentential stress, which represents pragmatic focus, is realized in questions. A summary and discussion follow in section 7.3.
7.1 Lower-Level Stress and Question Intonation

As noted in Chapter 2, one of the characteristics of Beijing Mandarin is that syllables tend to become weakly stressed or unstressed in certain prosodic positions, such as the medial position of a polysyllabic word or phrase and the final position of a lexicalized disyllabic word. In particular, the pattern of stress alternation (i.e., a stressed syllable followed by a weakly stressed or unstressed syllable) in disyllabic words is widely observed in Beijing Mandarin. And this is one of the features that distinguishes Beijing Mandarin from some other varieties of Mandarin such as Guoyu (i.e., the standard variety of Mandarin spoken in Taiwan).

The disyllabic word hélán "the Netherlands", for instance, is often produced with a considerably reduced rising tone, or even a completely neutralized tone, on the second syllable lán. This tendency is commonly observed, especially at utterance-final position. As highlighted by the circle in Figure 7.1, the sentence Zhōngguó děi yìng hélán "China has to beat the Netherlands" illustrates the leveling off of the pitch on the syllable lán in the last word hélán "the Netherlands". No rising contour is realized on lán, a Tone 2 syllable.

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79 See Wang 2003 (p.32, and references therein) for a discussion of the overwhelming tendency to compose disyllabic words in Beijing Mandarin.
Stress weakening in Beijing Mandarin is also observed at the phrasal level (Chao 1968: 39). Figure 7.2 shows that the Tone 4 syllable *dào* in the phrase *zhāodàole* (find - completion of action - perfective aspect particle) "have/has found" has lost its lexically-specified falling tone. That is, the tone on *dào* has become neutralized. As indicated by the circle in the figure, the pitch across the two syllables *dào* and *le* simply links the low tone on the preceding syllable *zhāo* "to find" and the high tone on the following syllable *xīn* "new".

Figure 7.1. Stress Weakening at Word-Level in Beijing Mandarin
The stress patterns found in Beijing Mandarin lead us to raise a question regarding how stress weakening interacts with question intonation. Specifically, when the utterance-final syllable becomes unstressed in yes-no questions, how is the final F0 rise realized?
7.1.1 Hypotheses

Recall that, along with the raising of overall pitch, the expansion of pitch range plays a crucial role in question intonation. In particular, pitch range tends to become expanded to the greatest extent over the last NP in yes-no questions (see Chapters 5 and 6 for a discussion). One of the issues related to lower level stress and question intonation in Beijing Mandarin is how the stress pattern of the utterance-final disyllabic word affects the pitch range expansion localized over the last NP. That is, the localized F0 cues may be manifested differently depending on the stress type (i.e., stressed vs. unstressed) of the second syllable in the utterance-final disyllabic word.

Two patterns can be hypothesized. The first pattern is that the pitch range becomes expanded most significantly on the second syllable of the utterance-final disyllabic word in yes-no questions. Given that the syllable is not a lexically-designated neutral tone syllable, its lexical tone may become realized in questions due to the expanded pitch range toward utterance-final position. For instance, the second syllable of the word hé lán "the Netherlands", which tends to become unstressed in statements as shown in Figure 7.1, may potentially be produced with a rising tonal contour in questions.

The other possible pattern is that pitch range expands primarily on the stressed syllable (i.e., the first syllable) of the utterance-final disyllabic word, while pitch range on the unstressed syllable (i.e., the second syllable) is considerably reduced. For instance, in the case of the word hé lán "the Netherlands", the most expanded pitch range is realized on the first syllable hé. Thus, localized F0 manipulations are manifested in a similar fashion in the two cases: first, when a syllable with a neutralized tone (an unstressed or weakly stressed syllable due to the positional
effect) is at utterance-final position and second, when an inherently neutral tone (inherently unstressed) syllable is at utterance-final position. The following section reports which of the two patterns is observed in the utterances examined in this study.

7.1.2 Results

To understand the realization of localized F0 cues in relation to the stress pattern of a disyllabic word, two sets of utterances are examined. In both sets, the utterance-final syllable (i.e., the second syllable of the final disyllabic word) is usually neutralized in Beijing Mandarin. The first set contains the word *hélán* "the Netherlands", whose trochaic stress pattern was shown in section 7.1.1, and the second set includes the word *yīshēng* "doctor".

Figure 7.3 presents the top lines and base lines of the first set of utterances: the statement *Zhōngguó děi yíng hélán* "China has to beat the Netherlands" and the corresponding Echo-UMQ. In the utterance-final word *hélán* "the Netherlands", the second syllable is originally a rising tone (Tone 2) syllable, although it often becomes unstressed. In the figure, the top lines (the solid lines) are the mean F0 values measured from the high tone targets of the syllables zhōng, yíng, hé, and lán. The base lines (the dotted lines) consist of the three mean F0 values measured from the low tone targets of the syllables děi (= yíng), hé and lán.

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80 See Dialogue 24 and Dialogue 25 in Appendix I for the contexts used to elicit this set of utterances.
81 The rising tone (Tone 2) syllable yíng starts where the lowest F0 of the low tone (Tone 3) syllable děi is realized. Thus, the low tone targets of the syllables are identical.
Figure 7.3. Top Lines and Base Lines: Zhōngguó děi yíng hélán "China has to beat the Netherlands" and Corresponding Echo-UMQ

Notice that the top line becomes raised significantly on the syllable hé (i.e., the preterminal point located at Time 0) in the UMQ. As a result, the high tone on this syllable is higher than that on the previous syllable yíng. In contrast, in the case of the utterance-final syllable lán (i.e., the terminal point) in the UMQ, the top line becomes significantly lowered and the pitch range becomes drastically reduced on that syllable. This shows that when the second syllable of a lexicalized disyllabic word is unstressed at utterance-final position, the pitch range expands primarily on the stressed syllable of the word.

While the second syllable of the word hélán "the Netherlands" tends to be unstressed rather consistently, that of another disyllabic word yīshēng "doctor" seems to be unstressed optionally. That is, the word is pronounced with either a high level tone (Tone 1) or a neutralized
tone on the second syllable. Out of 38 pairs\(^{82}\) of recordings of the statement *Wú Líng yuánlái xiāng zuò yīshēng* "Wu Ling originally wanted to become a doctor" and the InfoSeek-UMQ *Wú Yīng yuánlái xiāng zuò yīshēng?* "Wu Ying originally wanted to become a doctor?" made for the current study,\(^{83}\) a neutral tone was produced in 13 pairs, while a high level tone was pronounced in 20 pairs. In the other 5 pairs, a neutral tone is produced in the statement, while a high level tone is produced in the UMQ. Figures 7.4 and Figure 7.5 show the word for *yīshēng* "doctor" produced with a stressed second syllable and with an unstressed second syllable, respectively.

![Figure 7.4. Pitch Contour of *yīshēng* "doctor" with a Stressed Second Syllable](image1)

![Figure 7.5. Pitch Contour of *yīshēng* "doctor" with an Unstressed Second Syllable](image2)

Given that the second syllable of the word *yīshēng* "doctor" can be stressed or unstressed, we need to examine the utterances separately depending on the stress type of the second syllable of the word (i.e., high level tone vs. neutralized tone). Suppose that when the second syllable of a disyllabic word becomes unstressed, the pitch becomes raised not on the final neutral tone

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\(^{82}\) A pair of utterances produced by one subject was discarded since she produced the statement differently from the script.
syllable but on the syllable immediately preceding it, as seen in Figure 7.3. Now suppose that
there is another scenario where the final syllable preserves its lexical tone and the raising of pitch
is manifested primarily on the final syllable. If these are consistently-occurring scenarios, we
expect to observe different intonational patterns depending on the surface stress on the utterance-
final syllable.

In one set of 20 pairs of utterances in this study, both the statement and the UMQ are
produced with stress (a high tone) on the syllable shēng. In another set of 13 pairs, in the both
statement and the UMQ, the syllable shēng is unstressed (a neutral tone). The two sets are shown
in Figure 7.6 and Figure 7.7, respectively. Both figures present the top lines of the statement and
the corresponding InfoSeek-UMQ, which consist of the mean F0 values measured from the
syllables wú, lái, zuò, yī, shēng.84

83 Observe that the proper nouns in the statement and the Echo-UMQ are not identical: Wú Líng appears in
the statement and Wú Ying in that of the Echo-UMQ. As mentioned in section 4.1.2, some proper nouns in
target utterances within a dialogue set were changed using near-homophones in order to prevent
participants from recognizing the target sentences. Also see Dialogue 26, Dialogue 27, and Dialogue 28 in
Appendix I for the contexts used to elicit these sets of utterances.
84 The F0 values measured from the high tone target of the syllable yuán are not included, since a single
rising pitch stretches over the two syllables yuán and lái rather than the realization of two individual rising
tone contours. Note that this rising pitch contour can also be observed in Figures 7.4 and 7.5.
Figure 7.6. Top Lines: Statement *Wú Lǐng yuánlái xiǎng zuò yī shēng* “Wu Ling originally wanted to become a doctor?” and Corresponding InfoSeek-UMQ

In Figure 7.6, although the pitch initially starts a bit higher in the UMQ, the F0 difference between the two utterance types increases toward the end of the utterance. Thus, the biggest F0 difference is realized on the utterance-final syllable *shēng*, a syllable that has preserved its lexical tone (Tone 1, high level tone). We see a different pattern in Figure 7.7. Here, the final syllable is unstressed.
Figure 7.7. Top Lines: Statement "Wu Ling originally wanted to become a doctor" and Corresponding InfoSeek-UMQ

The F0 patterns of the two utterance types in Figure 7.7 clearly show that when the final word yīshēng is produced with the second syllable unstressed, the top line becomes raised primarily on the stressed syllable yī in the UMQ. The pitch range on the last word (i.e., the last two points in the figure) also becomes expanded significantly in the UMQ in comparison with the corresponding pitch range in the statement. Importantly, the pattern found in Figure 7.7 is very similar to the pattern shown in Figure 7.3.

The F0 patterns examined in Figures 7.3, 7.6, and 7.7 illustrate a situation in which lower-level stress interacts with question intonation. In particular, the stress pattern of the utterance-final disyllabic word affects the realization of the localized pitch raising in yes-no
questions. The prevalence of trochaic stress in disyllabic words in Beijing Mandarin may suggest that pitch raising can often be associated with a stressed terminal-syllable in yes-no questions in the language.

7.2 Sentential Stress and Question Intonation

Stress at a higher level, the sentence level, is manifested by local manipulation of pitch range (Jin 1996, Xu 1999, Xu, Xu, and Sun 2004, Peng et al. 2005). Given that the manipulation of pitch range is also crucial to signalling questions (see Chapters 5 and 6), a question arises as to how pitch range is employed to express sentential stress (e.g., broad focus, narrow focus) in questions.

7.2.1 Sentential Stress in Beijing Mandarin

As mentioned in section 2.2.2, F0 is the most crucial acoustic cue for the realization of sentential stress (e.g., pragmatic narrow or broad focus) (Jin, S.D. 1996, Xu 1999, Xu, Xu, and Sun, 2004). In particular, local prominence on a narrow-focused element, such as a word, is manifested by drastically expanded pitch range and is followed by compressed pitch range over the remaining portion of the prosodic domain (Jin, S.D. 1996, Xu 1999, Lee 2000, Peng et al., 2005). Figure 7.8 shows the overlaid F0 contours of one speaker's two tokens of the utterance Tā zuìjīn zhǎodào le xīn gōngzuò "He recently found a new job". The tokens contrast with each other only with respect to focus structure: the plain line is a broad-focused statement, and the dotted line is a narrow-focused statement.
In the narrow-focused statement, pragmatic narrow focus is placed on the word xīn "new". A significantly raised pitch contour can be observed on the focused element, as indicated by the arrow in the figure. It is also followed by compressed pitch on the word following the narrow-focused element, gōngzuò "job". Due to the reduced pitch range following narrow focus, the high tone across the word gōngzuò in the narrow-focused statement is considerably lower than that in the broad-focused statement. The syllables in the pre-focus portion of the narrow-focused utterance are also realized slightly lower in pitch than the same portion in the broad-focused statement. As a result, the dramatic pitch-raising on the narrow-focused syllable, xīn "new", becomes even more salient.

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85 The syllable-by-syllable labelling and the wave form are based on the broad-focused statement.
7.2.2 Sentential Stress and Question-Word Question Intonation

In the question-word question (QWQ, hereafter), question focus is often on the question-word. Therefore, it has been claimed that narrow focus is inherently realized on the question-word in QWQs (Cheng 1984, Haan 2002, Xu 2004). This leads us to examine the interface between sentential stress and question intonation in QWQs. In particular, if the pitch range tends to become expanded on the question word due to the narrow focus that is associated with it, we need to examine how the acoustic realization of narrow focus on the question word affects global pitch patterns. For instance, when the question word is located at utterance-final position, the global pitch may start low because of the expected narrow focus. If this happens, the global intonation patterns of the QWQ may resemble those of the corresponding statements, particularly over the early part of the utterance. To explore these issues, we first turn to Figure 7.9.

Figure 7.9 presents a comparison among three utterance types: the statement Tā huí měiguó le “He went back to the States”, the corresponding Echo-UMQ Tā huí měiguó le “He went back to the States?”, and the QWQ Tā huí něiguó? “Which country did he return to?”. In the three top lines in the figure, the line with the ♦ symbol represents the statement, and the ones with ▲ and with ● represent the UMQ and the QWQ, respectively. In both the statement and the UMQ, the five points are the two high tone targets measured from the syllables tā and huí, the low tone target from the syllable měi, and the mean F0 values taken from the two neutral tone

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86 See Dialogue 29 and Dialogue 30 in Appendix I for the contexts used to elicit this set of utterances.
syllables *guo* and *le*. In the QWQ, the F0 values were taken from the two high tone targets of the syllables *tā* and *huí*, the low tone target from the syllable *nēi*, and the mid-point from the last neutral-toned syllable *guo*.88

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87 In the two neutral tone syllables, the F0 value was taken from the mid-point from *guo* and the highest point of *le*.

88 To compare the pitch raising on the last syllable *guo* in the QWQ to the last syllable *le* in both the statement and the UMQ, the F0 value was measured from the highest F0 point of *guo* in QWQ.

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Figure 7.9 Comparison of Three Utterance Types: Statement *Tā huí měiguō le* “He went back to the States”, Corresponding Echo-UMQ, and QWQ *Tā huí nēiguō?* "Which country did he return to?"

We can see that the pitch range over the question-word *nēiguō* "which country" (i.e., the last two points in the QWQ) becomes expanded even more than it does over the word *měiguō* followed by the neutral toned syllable *le* "the United States + perfective aspect marker" in the UMQ (i.e., the

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last three points). The pitch range difference is indicated by the two vertical bars in the figure. (The shorter one is the UMQ, and the longer one is the QWQ.) The expanded pitch range over the question-word appears to support the claim that the question-word in the QWQ is focused. Furthermore, in spite of the expected narrow focus on the utterance-final question word, the overall pitch of the QWQ starts considerably higher than that of the statement, if not as high as that of the UMQ.

The pitch patterns observed in the rather short utterances in Figure 7.9 leave us with several unanswered questions. First, would the raised pitch on the final syllable (guo) in the QWQ in Figure 7.9 simply be a final rise rather than the expanded pitch range associated with narrow focus? Second, would the raising of overall pitch also be realized in a longer QWQ? Third, given that the QWQ examined in Figure 7.9 also expresses a speaker’s surprise, it is necessary to see a QWQ elicited as a genuinely information-seeking question.

Figure 7.10 below presents three utterance types: the statement Fàng zài nèi ge hézi lǐbiār le. “(I) put (them) in that box.”, the corresponding InfoSeek-UMQ, and the QWQ Fàng zài nèi ge hézi něǐbiār ne? “Where in that box shall I put (it)?”. Among the four pitch contours in the figure, the line with the ♦ symbol represents the statement; the one with ■ represents the MQ, and the one with ▲ represents the UMQ. The one with ● is the QWQ. In both the statement and the UMQ, the six points were the mean F0 values measured from the syllables fàng, zài, nèǐ, hé, lǐ/nèǐ, biār, and le.90

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99 See Dialogue 31 and Dialogue 32 in Appendix I for the contexts used to elicit this set of utterances.
90 In the two neutral tone syllables, biār and le, the F0 values were measured from the highest F0 point in the syllable biār and from the most stable region of the vowel in the syllable le.
Figure 7.10. Comparison of Three Utterance Types: Statement "Fàng zài nèi ge hézi lǐ biār le" “(I) put (them) in that box”, Corresponding InfoSeek-UMQ, InfoSeek-MQ, and QWQ “Fàng zài nèi ge hézi něi biār ne?” “Where in that box shall (I) put (them)?”

First, we can see that the pitch on the question-word (i.e., the pitch on biār in něi biār "where") is considerably raised, as indicated by the arrow in the figure. However, the pitch becomes lowered on the following neutral tone syllable ne. This pattern contrasts with the raised pitch on the corresponding syllable le in both the UMQ and the MQ. This difference suggests that the pitch raising on the syllable biār represents the expanded pitch range associated with the narrow-focused question-word rather than with a final rise.

Other observations can also be made. For example, although the F0 difference between the QWQ and the corresponding statement is reduced in comparison with that shown in Figure
7.9, the overall intonation of the QWQ still starts higher than that of the statement in these somewhat longer utterances. This shows that in spite of the expected pitch range expansion due to narrow focus toward utterance-final position, the overall pitch starts higher in the QWQ than that in the statement. This also suggests that the raising of the overall pitch may be important not only in UMQs but also in QWQs in Mandarin. Another finding we see in the figures is that the overall pitch in the QWQ is raised to a greater extent when it expresses a speaker's surprise. (Compare the pragmatics of the QWQs in Figures 7.9 and Figure 7.10.) These intonational patterns were also observed in both the Echo-UMQ and the Echo-MQ (see Chapter 5). It is also observed that in both the statement and the UMQ, the lowest pitch is not realized on the Tone 3 syllable měi but is delayed onto the neutral tone syllable guo that follows it. (Compare the second point (měi) to the third point (guo).)

We turn to next section to discuss the interaction between sentential stress and yes-no question intonation patterns.

7.2.3 Sentential Stress and Yes-No Question Intonation

This section examines the interface between sentential stress and intonation patterns in yes-no questions (UMQ and MQ). More specifically, two questions may be raised. First, given that the UMQ is characterized by expanded pitch range and an overall rising trend, particularly towards the end (see Chapter 5 and Chapter 6), how is pitch range compression in post-focus position realized when the pitch range is expected to expand to signal a question? And second, if a localized final rise is an important acoustic cue to signal a question, is the localized rise maintained after pitch range compression in post-focus position? These two questions will be
answered in the following sections. Section 7.2.3.1 outlines several hypotheses, and section 7.2.3.2 presents the results from this study to determine which hypothesis best handles the observed phenomena.

7.2.3.1 Hypotheses

Three hypotheses are proposed for how F0 is realized when it is used for two conflicting purposes, namely, pitch compression to signal the preceding narrow focus and pitch range expansion to signal a question. Figure 7.11 presents the schematized representation of the three hypotheses. (In the figure, "NF" refers to narrow focus. The solid line represents the top line while the dotted line represents the base line.)
Hypothesis 1 predicts that pitch range compression following narrow focus simply overrides pitch range expansion (or raised register) that would otherwise be realized in questions. As a consequence, no significant F0 pattern differences are predicted in post-focus position between statements and yes-no questions. Hypothesis 2 predicts that pitch becomes considerably compressed in post-focus position in questions. However, in contrast to Hypothesis 1, the localized final rise survives. Lastly, Hypothesis 3 predicts that although pitch range becomes

Figure 7.11. Schematized Hypotheses of Question Intonation with Narrow Focus
compressed in post-focus position in questions, it does not necessarily become as narrow as it would in statements. This hypothesis therefore suggests that lexical tones and a localized final rise may be identifiable in post-focus position in questions.

Though not presented in the schematized models in Figure 7.11, narrow focus may also affect question intonation in pre-focus position. That is, the global pitch in questions, which often starts higher than in the corresponding statements, may not be raised as much in pre-focus position to further accentuate the pitch expansion on the focused element to make it even more salient for the hearer. This possibility is also discussed in the following section.

7.2.3.2 Results

To understand how question intonation is realized with respect to sentential stress, it is necessary to compare a broad-focused question and the corresponding narrow-focused question. We also need to examine questions with different focus structures to compare them with the corresponding statements. Figure 7.12 presents the overlaid pitch contours of two questions: the broad-focused UMQ *Tā qù yīlóu chī màidānlào?* “He went down to the first floor to eat at McDonald's?” and the corresponding narrow-focused UMQ in which pragmatic narrow focus is placed on the word *yīlóu* "the first floor". In the figure, the solid line represents the broad-focused question while the dotted line shows the narrow-focused one.

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91 In Figures 7.12 and 7.13, the syllable-by-syllable labelling and the waveform are from the broad-focused utterance.
In Figure 7.12, we find a dramatic expansion of pitch range across the narrow-focused word *yīlóu* "the first floor", as indicated by the arrow, and the compressed pitch over the remaining part of the utterance. Due to the compressed pitch range in post-focus position, the overall rising trend, which is clearly present in the broad-focused question, is not seen in the narrow-focused question. As a result, the overall pitch in post-focus position in the narrow-focused question resembles the overall pitch in the broad-focused statement in Figure 7.13. However, despite the expected pitch range expansion on the narrow-focused element, pitch in the narrow-focused question still starts higher than the pitch in the broad-focused question as well as the broad-focused statement.
We can observe that the pitch range does not become reduced to the extent that it overrides lexical tonal contours. In spite of the reduced pitch range in post-focal position, the lexical tonal contours are still recognizable in the narrow-focused question. Furthermore, the rising tone on the utterance-final syllable láo is clearly realized. We can also compare the rising tonal contour on the syllable láo in the narrow-focused question and the tonal contour in the corresponding broad-focused statement in Figure 7.13. As highlighted by the double-ended arrow in the figure, the rising contour in the post-focal position in the narrow-focused question is realized as high as the contour in the broad-focused statement. This suggests that the localized final rise is crucial to signalling a question and that this function is the reason why this cue is maintained in post-focal position.

Since the lexical tonal contours and a localized terminal rise are still identifiable in post-focal position in the narrow-focused question, the next question concerns a possible difference between narrow-focused questions and the corresponding narrow-focused statements. Given that yes-no question intonation patterns are characterized as having an expanded pitch range (see Chapter 5), would the pitch range on the narrow-focused element become more expanded in a question than in the corresponding statement? To answer this question, we turn to Figure 7.14, in which we overlay a narrow-focused UMQ and the corresponding narrow-focused statement. This pair of utterances are illustrated here using one speaker.
In both utterances, pragmatic narrow focus is placed on the word xīn "new". In comparing the two pitch contours, one can readily see that the pitch range on the narrow-focused element is considerably more expanded in the question than in the statement. It can also be seen that the pitch starts significantly higher in the echo-question even though narrow focus is expected toward the utterance-final position. This may show that the expanded pitch range is associated with the pragmatic meaning of incredulity (see Chapter 5).

As for pitch compression following narrow focus, the two utterance types in Figure 7.14 do not show much of a difference. The pitch over the last word gōngzuō "job" in the question becomes as low as it does in the statement. Would this mean that an expanded pitch range in utterance-final position in the question is overridden by pitch range compression in post focal position? Or is this merely a speaker-specific pattern? An examination of the pitch patterns in Figure 7.15 will help to answer these questions.
Figure 7.15 presents the top lines and base lines of the utterances examined earlier in Figures 7.13 and 7.14. The mean F0 values were measured from 13 pairs of the utterances. The top line consists of the mean F0 values taken from the syllables Tā, zuì, jīn, xīn, gōng, zuò, and the base line is composed of the mean F0 values measured from the syllables jīn, zhāo, zuò.
Figure 7.15 shows that across speakers, the pitch range expansion on narrow focus portions becomes exaggerated in questions and that the pitch is still realized higher in post-focal position in the question than in the statement. Therefore, the compressed pitch following narrow focus in the question observed earlier in Figure 7.14 is simply a speaker-specific pattern.

Another important question pertains to how focus is realized in a syntactically-marked ma-particle question. Would focus be realized in an MQ in the same way that it would be in a UMQ? Figure 7.16 shows the overlaid pitch contours of the broad-focused statement Tā qù yīlóu chī mǎidāngláó "He/She went down to the first floor to eat at McDonald's" and the corresponding narrow-focused MQ. Figure 7.17 presents the narrow-focused MQ and the corresponding narrow-focused UMQ. 92 Again, narrow focus is on the word yīlóu "first floor".

92 The syllable-by-syllable labelling and the waveform in Figure 7.16 are from the statement, and those in Figure 7.17 are from the UMQ. The last segment should be lǎo in the statement and the UMQ, and lǎo+ma in the MQ.
Figure 7.16 shows that despite the expected narrow focus, the pitch contour starts higher in the MQ. In post-focal position, we can also see that the overall rising trend is not observed in the MQ due to the compressed pitch range. However, the pitch range does not become reduced to the extent that it overrides lexical tones. That is, lexical tones are still identifiable in post-focal position. These patterns are consistent with what we see in the narrow-focused UMQ presented in Figure 7.17.

Nonetheless, an interesting difference between the two question types is also observed in Figure 7.16. While the localized terminal rise is clearly manifested in the UMQ, it is considerably reduced in the MQ. And the overall pitch range is more reduced in post-focal position in the MQ than it is in the UMQ.

**7.3 Summary and Discussion**

This chapter examined the interface between stress and question intonation. Beijing Mandarin is a particularly good source for examining question intonation patterns in interaction with stress at the word-level, given the prevalence in the language of disyllabic words that show alternation between stressed and unstressed syllables. The findings in section 7.1 show that when the second syllable of an utterance-final disyllabic word becomes unstressed or neutral toned, the pitch range expansion associated with the global question intonation occurs most obviously not on the second syllable but on the initial syllable of the final word.

The findings in section 7.2 also shed light on the interface between sentential stress and question intonation. In the case of a question-word question, the question-word seems to receive
inherent narrow focus. Hence, the pitch raising realized on the utterance-final question-word is due to the expanded pitch range associated with narrow focus. The terminal rise seen in yes-no questions is not necessarily realized in question-word questions.

This chapter also finds that in both statements and yes-no questions, pragmatic narrow focus is realized with expansion of pitch range on the focused element and with reduction of pitch range over the remainder of the utterance. The greatest pitch range expansion on the narrow-focused element occurs in syntactically-unmarked yes-no questions. This may be related to the considerable expansion of overall pitch range realized in syntactically-unmarked yes-no questions. In post-focal position, although pitch becomes compressed, the lexical tones are still identifiable and the final rise is clearly realized in this question type. In the case of syntactically-marked ma-particle questions, the overall pitch range in post-focal position is reduced to a greater extent compared to syntactically-unmarked yes-no questions. However, the lexical tones in post-focal position can still be recognized. In pre-focal position, pitch starts higher in both types of yes-no questions in spite of the pitch range expansion expected toward the utterance-final position.

Returning now to the three hypotheses discussed in section 7.2, the pitch patterns in narrow-focused yes-no questions are predicted best by Hypothesis 3. To compare the differences between the F0 realization of narrow focus in yes-no questions and that in statements, Figure 7.18 provides a schematized representation of intonation with narrow focus in yes-no questions as
compared with narrow focus in the corresponding statements. The solid line represents the top line of a yes-no question, and the dotted line represents that of the corresponding statement. The dashed line represents the base line of both utterance types.

Figure 7.18. Schematized Representation of Question Intonation with Narrow Focus
CHAPTER 8

CONCLUSION

The present study explored the question prosody of Beijing Mandarin. In particular, it examined how global and localized F0 manipulations are employed to signal a question in two types of yes-no questions, namely, syntactically-unmarked yes-no questions and syntactically-marked ma-particle questions. This study further investigated how stress, which is also manifested by the F0 parameter, interacts with these F0 cues. The findings regarding these two issues are summarized in this chapter, together with interpretations of these findings.

Concerning F0 manipulations in the two types of questions, this study finds that global pitch manipulations are performed in close connection with both syntax and pragmatics. Therefore, the results do not support early claims that intonational cues are important only in the absence of a syntactic question marker (e.g., the ma-particle, a question-word). This study also finds that the higher pitch often associated with yes-no questions in early studies reflects more global pitch manipulations, that is, an expanded pitch range and an overall rising trend in the intonational contour.

Significant expansion of pitch range is associated with Echo-questions, which are uttered to express such pragmatic meanings as surprise or incredulity by echoing the previously uttered statement. This finding is compatible with the association between the expansion of pitch range
and incredulity questions found in other languages, such as English (e.g., Hirschberg and Ward 1992). This study finds this pattern in both syntactic question types and therefore suggests that the expansion of pitch range accompanies certain pragmatic functions and is not necessarily associated with some specific syntactically-based sentence type.

Comparing Echo-questions to InfoSeek-questions, this study further confirms the contribution of the pragmatics of questions to the formation of intonational patterns. While an expanded pitch range and raised top line are executed to a smaller degree in InfoSeek-questions in comparison with the corresponding Echo-questions, the most salient pitch range expansion is manifested over the important question information, i.e., what is being inquired about by the questioner. This pattern is also seen in both syntactic types of yes-no questions.

Along with pragmatics, syntax also interacts with question intonation patterns. That is, when both syntactic types of yes-no questions are uttered for comparable pragmatic purposes (Echo or InfoSeek), the expansion of pitch range is manifested to a greater extent in syntactically-unmarked questions than in the corresponding ma-particle questions. This tendency becomes particularly salient toward utterance-final position. This suggests that intonational cues are exaggerated in the absence of a syntactic cue to signal to the hearer that a question is being uttered rather than a statement.

This study also finds that a more localized F0 rise toward utterance-final position is also a crucial F0 cue in yes-no questions. More specifically, while the greatest amount of raising of the top line appears on the last high tone target (i.e., the high tone value on the last stressed Tone 1, Tone 2, or Tone 4 syllable, or a high tone target immediately preceding the utterance-final Tone 3 syllable), the localized raising of the top line and the expansion of pitch range are performed across a domain larger than a syllable unit. In the utterances examined in the study, the domain
corresponds to the utterance-final noun phrase (NP), which conveys the most crucial question information in a given context. The prosodic behavior of the ma-particle further supports the contention that the domain for the localized final rise is larger than that of a syllable. The ma-particle forms a prosodic unit with the preceding syntactic constituent (e.g., NP) rather than standing alone as an independent prosodic unit. This study therefore refutes earlier claims that a particular syllable, such as the last syllable, is associated with the final rise in yes-no questions.

It was also found that pitch manipulations at two different levels – global and more localized levels – are performed in interaction with each other. In the case of InfoSeek-questions, while the overall intonation is raised rather moderately, the raising of the top line is most salient over the last NP. In the case of Echo-questions, the pitch range seems to become expanded over the same domain, while the top line is significantly raised over the entire utterance. This indicates that both raising of the top line and expansion of the pitch range are crucial localized F0 cues in yes-no questions.

Figure 8.1 is the schematized representation of the global and localized F0 manipulations observed in both pragmatic types of yes-no questions. In the figure, the solid line represents questions, and the dotted line represents statements. The dashed line shows the pitch pattern of ma-particle questions, which have less pitch range expansion than the corresponding syntactically-unmarked questions.
<table>
<thead>
<tr>
<th>Question Type</th>
<th>Schematized Representation of F0 Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>InfoSeek-Question</td>
<td><img src="image1.png" alt="InfoSeek-Question Diagram" /></td>
</tr>
<tr>
<td>Echo-Question</td>
<td><img src="image2.png" alt="Echo-Question Diagram" /></td>
</tr>
</tbody>
</table>

Figure 8.1. Schematized Representation of F0 Patterns in Yes-No Questions

While the present study identifies the domain for the more localized F0 cues in yes-no questions as the utterance-final NP, further research is needed to understand whether the domain can correspond to other syntactic constituents, such as VPs, and how the domain changes in relation to discourse contexts in which the question is uttered. In addition, how this domain is related to such prosodic domains as the "phonological phrase" or "superfoot" (Shih 1986, 1997) also needs to be investigated.

The findings of the present study shed light on the interaction between question intonation and stress at both the word level and the sentence level. Two observations can be made. First, when the second syllable of the utterance-final disyllabic word is unstressed due to the stress weakening tendency in Beijing Mandarin, the pitch range expansion associated with the localized question cues occurs most saliently on the initial syllable of the word.

Second, at the sentence level, question intonation also interfaces with sentential stress. On the one hand, in the case of question-word questions, the question-word seems to receive
inherent narrow focus. Hence, the pitch raising realized on the utterance-final question-word reflects the expanded pitch range associated with narrow focus. On the other hand, while pragmatic narrow focus is realized with considerable expansion of pitch range on the focused element, followed by a reduction of pitch range over the remainder of the utterance in both statements and yes-no questions, the pitch range associated with narrow focus becomes most expanded in syntactically-unmarked yes-no questions.

In post-focal position, although pitch becomes compressed, the lexical tones are still identifiable and the final rise is clearly realized in syntactically-unmarked questions. In the case of syntactically-marked ma-particle questions, the overall pitch range in post-focal position is reduced to a greater extent in comparison to syntactically-unmarked yes-no questions. However, the lexical tones can be still recognized. In pre-focal position, the pitch contour starts higher in both syntactic types of yes-no questions in spite of the pitch range expansion expected later in the utterance. The schematized representation of yes-no question intonation with narrow focus provided in Figure 7.18 is reproduced in Figure 8.2 below. (The solid line represents the top line of a yes-no question, and the dotted line represents that of the corresponding statement. The dashed line represents the base line of both utterance types.)

Figure 8.2. Schematized Representation of Question Intonation with Narrow Focus
As shown in Figure 8.2, although pitch range becomes compressed in post-focal position in questions, it generally does so to a lesser degree than in statements. This study therefore proposes that the expansion of pitch range to signal a question is still realized in the context where pitch range is expected to become compressed to express narrow focus.

The realization of both global and localized F0 cues in questions raises a question regarding the role of different types of F0 cues in perception. The perceptual significance of the localized F0 raising at the end of a question, which was often suggested in early studies (e.g., Rumjancev 1972), may be due to a limited set of experimental utterances used in the studies. That is, since the utterances were often elicited using a list of target utterances, the pitch patterns found in those utterances may only represent certain pragmatic purposes associated with read speech. For a comprehensive study of the results from the early studies, it is necessary to examine a larger set of utterances that can represent a variety of syntactic types and pragmatic types of questions.

The different pitch patterns found in the two pragmatic question types examined in this study also suggest a possible difference in the use of global and localized F0 cues in perception. That is, while the overall pitch starts significantly higher in Echo-questions, pitch raising is performed over the utterance-final NP in InfoSeek-questions. Therefore, we may hypothesize that global raising of pitch may play an important role in perception in Echo-questions, while localized F0 cues may be more crucial for listeners in InfoSeek-questions. If so, we would expect a timing discrepancy in perception with regard to the pragmatics of questions. Listeners may identify Echo-questions as questions faster than they would identify InfoSeek-questions as questions. These issues await future research.
APPENDIX A DIALOGUES

Appendix A provides the thirty-two dialogues used to elicit the target utterances. English translations are also provided. The dialogues are arranged in the order of the discussions in Chapters 5 through 7, and the target utterances are in boldface in each dialogue. Several dialogues are presented twice to facilitate readers' locating dialogues.

DIALOGUE 1)

… 王 和 張 在 路 上 看 著 李 先 生...
… Wáng hé Zhāng zài lù shàng kànzhé Lǐ xiānshēng…
(… Wang and Zhang are looking at Mr. Li on the street …)

王: 他去哪儿?
“Where is he going?”

Tā qù nǎr?

张: 他去医院.
“He is going to the hospital.”

Tā qù yīyuàn.

王: 他去医院?
“He is going to the hospital?”

Tā qù yīyuàn?

张: 嗯.
“Yes.”

En.

王: 他生病了吗?
“Is he sick?”

Tā shēngbìng le ma?

张: 没有. 他 妈 妈 住 院 了. 他 去 看 他 妈 妈.
Méiyǒu. Tā māma zhùyuàn le. Tā qù kàn tā māma.

“No. His mom was hospitalized. He is going to see his mom.”

DIALOGUE 2)

… 王 和 張 在 辦 公 室 看 到 李 先 生 正 在 請 病 假…
… Wáng hé Zhāng zài bànghōngshì kànzhào Lǐ xiānshēng zhèngzài qǐng bìngjià.
(… In the office, Wang and Zhang see Mr. Li requesting sick leave…)

王: 他去医院吗?
“Is he going to go to the hospital?”

Tā qù yīyuàn ma?

张: 嗯. 他 支 气 管 炎 又 犯 了.
“Yes. He has bronchitis again.”

En. Tā zhīqìguān yán yòu fàn le.

… 第 二 天…
… Di èr tiān…
(...The next day…)  
王：他 昨 天 去 看 醫 生 了 嗎？   “Did he go to see a doctor yesterday?”
Tā zuótiān qù kàn yīshēng le ma?
张：他 昨 天 去 看 醫 生 了。
(Yes.) He saw a doctor yesterday.”
Tā zuótiān qù kàn yīshēng le.
王：那，他 為 什 麼 沒 來 上 班？   “Then why didn’t he come to work?”
Nà, tā wèi shénme méi lái shàngbān?
张：他 來 了。我 剛 才 看 見 他 了   “He came. I saw him a minute ago.”
Tā lái le. Wǒ gāngcái kànjiàn tā le.

DIALOGUE 3)  
王：小 王, 楊 意 不 在 嗎？   “Xiao Wang, isn't Yang Yi in?”
Xiăo Wáng, Yáng Yì búzài ma?
张：你 找 他 干 什 麼？   “Why are you looking for him?”
Nǐ zhǎo tā gàn shénme?
王：我 找 他 打 籃 球。   “I am looking for him to play basketball.”
Wǒ zhǎo tā dǎ lánqiú.
张：你 不 知 道 他 的 腳 扭 傷 了 嗎？   “Don't you know he sprained his ankle?”
Nǐ bù zhīdào tā de jiăo niùshāng le ma?
王：真 的 嗎？我 要 給 他 打 個 電 話 問 一 下。   “Really? I have to call him and ask how he's doing.”
Zhēndé ma? Wǒ de ěr tā dà ge diànhuà wèn hòu yǐxià.

DIALOGUE 4)  
… 王 來 張 家 找 張 先 生 的 哥 哥…
… Wang came to Zhang's home to find Mr. Zhang's older brother…
王：你 好, 張 義 在 嗎？   “Hello, is Zhang Yi in?”
Nǐ hăo, Zhāng Yì zài ma?
张：是 你 啊, 他 在 學 校 還 沒 回 來, 你 進 來 等 他 吧。   “Oh, it's you. He hasn't come back from school yet. Why don't you come in and wait?”
Shì nǐ a. Tā zài xuéxiào háiméi huílái. Nǐ jìn lái děng tā ba.
王：好, 謝 謝。   “Okay, thanks.”
Hăo, xièxiè.
张：找 他 打 籃 球 嗎？   “Looking for him to play basketball?”
Zhǎo tā dǎ lánqiú ma?
王：嗯。   “Yes.”
En.
… 张拿来一点花生米…
… Zhang takes out some peanuts…

张： 唉，你先吃一点花生米吧。是张义昨天刚买的，很新鲜。
“Why don’t you have some peanuts? Zhang Yi just bought them yesterday, so they are very fresh.”

王： 他喜欢吃花生米吗?
“Does he like eating peanuts?”

张： 是啊，他最喜欢吃花生米了。
“Yes, he likes eating peanuts most.”

DIALOGUE 5)

王： 你猜…
“Guess what.”

张： 什么?
“What?”

王： 李信明年要去哪儿?
“Where is Li Xin going next year?”

张： 香港?
“Hong Kong?”

王： 不对。
“No.”

张： 那，是哪儿?
“Then, where?”

王： 李信明年要去新西兰。
“Li Xin is going to New Zealand next year.”

张： 是啊。
“Yes.”

王： 最近找的工作?
“Did he get a new job recently?”

张： 他最近找到了新工作。
“He recently found a new job.”

王： 是啊。听说公司派李信明年去新西兰。
“Yes, I heard that the company will send him to New Zealand next year.”

DIALOGUE 6)

王： 听说李信要换工作了。
“I heard Li Xin is going to change jobs.”

张： 他最近找到了新工作吗?
“Did he get a new job recently?”
Tā zuìjìn zhǎodào le xīn gōngzuò ma?

王：是啊。 “Yes.”

张：他最近找到了什么工作？ “What kind of job did he find lately?”

王：一个新西兰的电脑公司。他在以前的公司做到年底。

Yī ge xīnzhīlán de diànnǎo gōngsī. Tā zài yǐqián de gōngsī zuòdào niándǐ. “A New Zealand computer company. He is going to work at his current company until the end of this year.”

张：最近工作这么难找，他却找到了一个外企的工作！

Zúijìn gōngzuò zhème nán zhǎo, tā què zhǎodào le yī ge wàiqǐ de gōngzuò. “It's been very difficult to get a job lately, yet he found one in a foreign company!”

王：没错，可是他多能干啊。

Méicuò, kěshì tā duō nénggàn na. “Right, but he is so competent.”

张：李信明年要去新西兰吗？ “Li Xin is going to New Zealand next year?”

Li Xīn míngnián yào qù xīnzhīlán ma?

王：是，而且他的女朋友也跟他一块儿去啊。

Shì, érqiě tā de niǚpéngyǒu yě tān gēi tā yīkuài qù a. “Yes, and he is going with his girlfriend.”

张：他怎么这么幸运！

Tā zěnme zhème hǎo yùnqì. “How lucky is he!”

DIALOGUE 7)

…在电 影 院 门 口, 王 和 张 看 见 小 刘 在 购 电 影 票…

…At the entrance of the theatre, Wang and Zhang see Xiao Liu buying a ticket…

王：看，那 是 小 刘 吧。

Kàn, nà shì xiǎo Liú ba. “Look, that's Xiao Liu, right?”

张：可 不 是。这 家 伙 又 来 看 电 影 了。

Kě bùshi. Zhè jiāhuǒ yòu lái kàn diànyǐng le. “It is! This guy came to watch a movie again!”

王：他 喜 欢 看 电 影？

Tā xǐhuān kàn diànyǐng. “Does he like watching movies?”

张：对, 他 可 是 一 个 电 影 迷。

Duì, tā kě shì yī ge diànyǐngmí. “Yes. He is a movie fan.”

王：他 喜 欢 看 什 么 电 影？

Tā xǐhuān kàn shénme diànyǐng? “What kind of movies does he like watching?”

张：他 什 么 都 看。

Tā shénme dōu kàn. “He watches all kinds.”

DIALOGUE 8)

…王 喜 欢 小 刘。他 想 知 道 怎 么 约 她 出 去…

…Wáng xǐhuān xiǎo Líú. Tā xiǎng zhīdào zěnme yuè tā chū qù …

…Wang is interested in Xiao Liu. He wants to know how to take her out …
王：不知道小劉平時喜歡做什麼。  
“我不知曉záoxǔ liú wūshǐ xǐhuān zuò shénme.”

張：小劉嗎？她喜歡做的事可多了。  
“záoxǔ Lǐ má？Tā xǐhuān zuò de shì kě duō le.”

王：她喜歡看電影嗎？  
“Tā xǐhuan kàn diànyīng ma?”

張：你猜呢？  
“Nǐ cāi ne?”

王：不知道，所以我問你啊。  
“I don’t know, so I am asking you.”

張：她喜歡看電影。  
“Tā xǐhuān kàn diànyīng.”

王：那我就請她看電影吧。  
“I will ask her to go to see movies, then.”

DIALOGUE 9)

王：我剛才看到李明過馬路。  
“Wǒ gāncái kàndào Lǐ Míng guò mǎlù.”

張：我叫他去買一點東西，我在煮牛肉湯。  
“Wǒ jiàotā qù māi yīdiǎn dòngxi. Wǒ zài zhǔ niúròutāng.”

王：他去有利商店買牛肉嗎？  
“Tā qù Yǒuli shāngdiàn mǎi niúròu ma?”

張：嗯。  
“En.”

王：他去有利商店買什麼？  
“Shénme?”

張：他去有利商店買牛肉。  
“Tā qù Yǒuli shāngdiàn mǎi niúròu.”

王：他馬上回來嗎？  
“Nà, tā mǎshang huílái ma?”

張：嗯。  
“En.”

DIALOGUE 10)

王：他去有利商店買牛肉？  
“Tā qù Yǒuli shāngdiàn mǎi niúròu?”

張：嗯，他還要去友誼商店。  
“En, Tā hái yào qù Yǒuyì shāngdiàn.”

王：他去友誼商店買什麼？  
““What is he going to buy at the Friendship store?”

張：去那兒買酒。  
“Qù nàr māi jiǔ.”

王：好麻煩啊。  
“That sounds like a hassle.”

Hào máfán a.
DIALOGUE 11)

王: 他在哪儿?
Tā zài nàr?
张: 他去一楼吃午饭。
Tā qù yī lóu chī wǔfàn.
王: 他去一楼吃什么?
Tā qù yī lóu chī shénme?
张: 他去一楼吃麦当劳。
Tā qù yī lóu chī màidāngláo.
王: 他去一楼吃麦当劳吗?
Tā qù yī lóu chī màidāngláo ma?
张: 对, 最近楼下新开了一个麦当劳。
Dùi. Zuìjìn lǒuxià xīn kāi le yī ge màidāngláo.

“Where is he?”
“He went down to the first floor to eat lunch.”
“He went down to the first floor to eat at McDonald's.”
“Did he go downstairs to eat?”
“He went to McDonald's.”
“Did he go down to the first floor to eat McDonald's?”
“Yes. A new McDonald's opened recently downstairs.”

DIALOGUE 12)

王: 都十二点半了, 他去哪儿?
Dōu shíèr diǎn bàn le, Tā qù nàr?
张: 他去麦当劳了。
Tā qù màidāngláo le.
王: 他去一楼吃麦当劳?
Tā qù yī lóu chī màidāngláo?
张: 可不是啊, 本来我们一起去吃火锅的。
Kěbùshì ma, běnlái wǒmen yīqǐ qù chī huǒguō de.
“That’s what I’m saying! We originally planned to have hot pot together!”

DIALOGUE 13)

王: 李先生今天在哪儿?
Lǐ xiānshēng jīntiān zài nàr?
…王看到李先生的办公室里灯还开着…
…Wáng kàn dào Lǐ xiānshēng de bàngōngshì lǐ dēng hái kāizhe…
(…Wang saw that a light was still on in Mr. Li’s office…)
王: 李先生今天在办公室?
Lǐ xiānshēng jīntiān zài bàngōngshì?
张: 是啊, 他今天需要加班。
Shì a. Tā jīntiān xūyào jiābān.
王: 我以为他在家呢。
Wǒ yǐwéi tā zài jiā ne.
张: 他几乎每天都在办公室工作。
Tā jīhū méitiān dōu zài bàngōngshì gòngzuò.
…过两天，王给张打电话问李先生在哪儿…
…Guòliàngtiān, Wáng gěi Zhāng dà diànhuà wèn Lǐ xiānshēng zài nǎr…
(… Two days later, Wang calls up Zhang to ask where Mr. Li is…)

王先生今天在办公室吗？
Lí xiānshēng jǐntiān zài bānghóngshì ma?
“Is Mr. Li in the office today?”

张：等一下，我问一下。
Děng yī xià, wǒ wèn yī xià.
“Wait a second. Let me ask.”

…过一分钟…
…Guò yī fēn zhōng…
(… After a minute…)

张：喂，王先生吗？
Wèi, Wáng xiānshēng ma?
“Hello? Mr. Wang?”

王：是我。
Shì wǒ.
“Yes, this is he.”

张：李先生今天在办公室。
Lí xiānshēng jǐntiān zài bānghóngshì.
“Mr. Li is in his office today.”

王：好，谢谢。
Hǎo, xièxiè.
“Good, thanks.”

DIALOGUE 14)

…王先生和张先生在厨房里…
…Wáng hé Zhāng zài chūfāng lǐ…
…Wang and Zhang are in the kitchen…

王：这个黏糕很好吃。是你做的吗？
Zhè ge niángāo hěn hǎochī. Shì nǐ zuò de ma?
“This rice cake is very delicious. Did you make it?”

张：不是，是我妈妈做的。
Bùshì. Shì wǒ mámā zuò de.
“No, my mom made it.”

王：黏糕蒸多久？
Niángāo zhēng duōjiǔ?
“How long should we steam the rice cake?”

张：五分钟吧。
Wǔ fēn zhōng ba.
“Five minutes, maybe.”

王：黏糕蒸五分钟？
Niángāo zhēng wǔfēnzhōng?
“(We) steam the rice cake for five minutes?”

张：好像是吧。
Háoxiàng shì ba.
“I guess so.”

王：五分钟太短了吧。
Wǔ fēn zhōng tài duǎn le ba.
“Five minutes is too short.”

张：那我给我妈妈打个电话问问。
Nà wǒ gěi wǒ māmā dā ge diànhuà wènwen.
“Well, let me call my mom and ask.”

DIALOGUE 15)

…张先生在蒸鱼，黏糕，饺子…
… Zhāng zài zhēng yú, niángāo, jiāozi…
…Zhang is steaming fish, a rice cake, and dumplings…

王：你蒸什么？我来帮你。
Nǐ zhēng shénme？Wǒ lái bāng nǐ.

张：鱼、黏糕、饺子，我都准备好。麻烦你把它们都蒸上吧。
Yú, niángāo, jiāozi, wǒ dōu zhùnbèi hào le. Máfàn nǐ bā tāmen dōu zhēngshàng ba.

“Fish, a rice cake, dumplings, I have all these ready. Why don't you steam all these?”

王：好，我蒸黏糕。
Hǎo. Wǒ zhēng niángāo.

张：黏糕蒸五分钟。
Niángāo zhēng wǔfēnzhōng.

王：那鱼呢？
Nà yú ne？

张：十分钟。
Shífēnzhōng.

王：饺子呢？
Jiāozi ne？

张：二十分钟。
Èrshīfēnzhōng.

……王先蒸黏糕……
……Wáng xiān zhēng niángāo …
……Wang wants to steam the rice cake first……

王：黏糕蒸五分钟吗？
Niángāo zhēng wǔfēnzhōng ma？

张：不是刚说了吗，是五分钟。
Búshì gāng shuō le ma, shì wǔfēnzhōng.

“(Do we) steam the rice cake for five minutes?”

DIALOGUE 16)

… 王和张是夫妻。他们要去旅行…
… Wáng hé Zhāng shì fūqī. Tāmen yào qù lǚxíng…
……Wang and Zhang are a married couple. They are about to go on a trip…

王：你看到照相机了吗？
Nǐ kàndào zhàoxiàngjī le ma？

张：我没看到。可是早上我看到你妈妈正在收拾东西。
Méi kàndào. Kěshì zǎoshìng wǒ kàndào nǐ māmā zhèngzài shòushí dōngxī.

“No, but I saw your mom organizing things in the morning.”

……王注意到墙角有一个盒子……
……Wáng zhùyìdào qiángjiăo yǒu yī ge hézi …
……Wang noticed that there is a box at the corner……

王：放在那个盒子里边儿了吗？
Fàng zài nèi ge hézī lìbiār le ma？

张：我来打开放吧。
Wǒ lái dǎ fàng ba.

“Let me open it and see.”

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王: 放在那个盒子里边儿了?
Fàng zài nèi ge hézi lǐ biān er le?
张: 嗯.
En.

DIALOGUE 17)

王: 你的这些书都放哪儿?
Nǐ de zhèixiē shū dōu fàng nǎr?
张: 就放在那个盒子里好了.
Jiù fàng nà ge hézi lǐ hǎo le.
王: 放在那个盒子里边儿呢?
Fàng zài nèi ge hézi lǐ biān er ne?
张: 那些书都是你的, 不是我的.
Nà xiē shū dōu shì nǐ de, bù shì wǒ de.
王: 对. 我搞错了. 那你的书呢?
Duì. Wǒ gāo cuò le. Nà nǐ de shū ne?
张: 放在那个盒子里边儿了.
Fàng zài nèi ge hézi lǐ biān er le.

DIALOGUE 18)

王: 他昨天去看谁呢?
Tā zuòtiān qù kàn shéi ne?
张: (… 指著伊申的桌子…) (… Pointing at Yi Shen’s desk…)
Zhǐzhe Yī Shēn de zhuōzi…
王: 他昨天去看伊申了?
Tā zuòtiān qù kàn Yī Shēn le?
张: 嗯.
En.
王: 他们的问题解决了吗?
Tāmen de wèntì jiějué le ma?
张: 不知道. 我还没问过他呢.
Bù zhīdào. Wǒ hái méi wènguò tā ne.
**DIALOGUE 19)** (Same as Dialogue 2)

… 王和张在办公室看到李先生正在请病假…
… Wáng hé Zhāng zài bànzhōngshì kàn dào Lǐ xiānshēng zhèngzài qǐng bìngjià.
(… In the office, Wang and Zhang see Mr. Li requesting sick leave …)

王： 他去医院吗?  
Tā qù yīyuàn ma?  

“Is he going to go to the hospital?”

张： 嗯，他支气管炎又犯了。  
En. Tā zhīqìguānyán yòu fàn le.  

“Yes. He has bronchitis again.”

… 第二天…
… Dì èr tiān…  
(…The next day…)  

王： 他昨天去看医生了吗?  
Tā zuótiān qù kàn yīshēng le ma?  

“Did he go to see a doctor yesterday?”

张： 他昨天去看医生了。  
Tā zuótiān qù kàn yīshēng le.  

“(Yes.) He saw a doctor yesterday.”

王： 那，他为什么没来上班?  
Nà, tā wèi shénme měi lái shàngbān?  

“Then, why didn’t he come to work?”

张： 他来了。我刚才看见他了。  
Tā lái le. Wǒ gāngcái kànjiàn tā le.  

“He came. I saw him a minute ago.”

**DIALOGUE 20)**

王： 小妹和阿毛上午去游乐园了吧。  
Xiǎomei hé Ā Máo shàngwǔ qù yóuyuán le ba.  

“Xiao Mei and A Mao went to a theme park in the morning, right?”

张： 对。  
Duì.  

“Yes.”

王： 他们下午要去哪儿?  
Tāmen xiàwǔ yào qù nár?  

“Where are they going in the afternoon?”

张： 他们好像要去商店买泳衣。  
Tāmen hǎoxiǎng yào qù shāngdiàn mǎi yǒngyī.  

“They seem to be going to a store to buy swimming suits.”

王： 他们下午要去游泳馆吗?  
Tāmen xiàwǔ yào qù yóuyǒngguǎn ma?  

“Are they going to a swimming pool in the afternoon?”

张： 什么?  
Shénme?  

“What? (What did you say?)”

王： 他们下午要去游泳馆?  
Tāmen xiàwǔ yào qù yóuyǒngguǎn?  

“They are going to a swimming pool in the afternoon?”

张： 不会吧，今天游泳馆不开。  
Bùhuì ba, jīntiān yóuyǒngguǎn bù kāi.  

“They shouldn't. The swimming pool is not open today.”

**DIALOGUE 21)**

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王: 我想跟他們談一點事.三點可以嗎?
Wǒ xiǎng gēn tāmen tán yídiǎn shì. Sāidiǎn kěyǐ ma?
“Id like to talk with him a little bit. Is three o'clock okay?”
张: 三點不行.
Sāidiǎn bùxíng.
王: 為什 么?
Wèi shénme?
张: 他們下午要去游泳館.
Tāmen xiàwǔ yào qù yóuyǒngguǎn.
王: 那 我明天再來找他們吧.哎,彼得呢?他還在這兒 嗎?
Nǎ wǒ míngtiān zài lái zhǎo tāmen ba. Āi, Pi dē ne? Tā hái zài zhèr ma?
“Then let me come to find them again tomorrow. By the way, about Peter? Is he
still here?”
张: 他回美國了.
Tā huí měiguó le.
王: 他回美國了?
Tā huí měiguó le?
张: 是啊,你還 不知道 嗎?
Shì a, nǐ hái bù zhīdào ma?
“Yes, didn't you know that?”

DIALOGUE 22) (Same as DIALOGUE 4)

… 王來 張家找 張先生的哥哥...
… Wáng lái Zhāngjiā zhǎo Zhāng xiānshèng de gēge...
… Wang came to Zhang's home to find Mr. Zhang's older brother…
王: 你好, 張義在嗎?
Nǐ hǎo, Zhāng Yì zài ma?
张: 是你啊.他在學校還沒回來.你進來等他吧.
Shì nǐ a, Tā zài xuéxiào háiméi huílái. Nǐ jìn lái děng tā ba.
“Oh, it's you. He hasn't come back from school yet. Why don't you come in and wait?”
王: 好,謝謝.
Hǎo, xièxiè.
张: 找他 打籃球嗎?
Zhǎo tā dǎ lánqiú ma?
王: 是.
Shì.
“Looking for him to play basketball?”

… 張 拿來一點花生米…
… Zhāng ná lái yídiǎn huāshēngmǐ …
… Zhang takes out a bit of peanuts…
张: 哎, 你先 吃一點 花生米吧.是 張義 昨天剛買的,很新鮮.
Āi, nǐ xiān chī yídiǎn huāshēngmǐ ba. Shi Zhāng Yì zuótiān gāng mǎi de, hěn xīnxiān.
“Why don't you have some peanuts? Zhang Yi just bought these yesterday,
sō these are very fresh.”
王: 他喜歡吃花生米嗎?
Tā xǐhuān chī huāshēngmǐ ma?
“Does he like peanuts?”
張：是啊，他最喜歡吃花生米了。 "Yes, he likes peanuts most."

DIALOGUE 23)

…看着张先生的小孩儿…
…Kànzhē Zhāng xiānshēng de xiǎoháir…
…Looking at Mr. Zhang’s child…

王：他喜歡吃什麼？ "What does he like eating?"
張：他喜歡吃花生米。 "He likes peanuts."
王：什麼？ "What?"
張：花生米。 "Peanuts."
王：他喜歡吃花生米？ "He likes peanuts?"
張：是啊。 "Yes."

王：他還這麼小怎麼吃花生米呢？牙還沒長齊呢。 "How does this little kid eat peanuts? His teeth haven't even grown yet."

DIALOGUE 24)

王：明天中國隊得贏。 "China has to win tomorrow."
張：中國得贏哪國？ "Which country does China have to beat?"
王：中國得贏荷蘭。 "China has to beat the Netherlands."
張：中國得贏荷蘭？ "China has to beat the Netherlands?"
王：嗯。 "Yes."
張：為什麼？ "Why?"
王：不然的話，小組出不了線了。 "Otherwise, the (Chinese) team can't go to the next level."

Bùrán de huà, xiǎozǔ chūbùliáo xiàn le.

DIALOGUE 25)

王：明天中國跟荷蘭有比賽。 "China has a match with the Netherlands tomorrow."

Míngtiān zhōngguó gēn hélán yǒu bǐsài.
張：中 国 得 贏 荷 蘭 嗎？
Zhōngguó dé yìng hélán ma?
王：不 必, 中 國 隊 到 現 在 沒 有 輸 過 呢, 明 天 不 贏 也 可 以 出 線。
Bùbì, zhōngguó duì dào xiànzài méiyǒu shūguò ne. Míngtiān bú yíng yě kěyǐ chūxiàn.
“Not necessarily. China hasn’t lost any games so far, so even if China loses, she can still move on the next level.”

DIALOGUE 26)

王：大 家 好 像 都 沒 有 做 他 們 本 來 想 做 的 事。
Dā jiā hǎoxiàng dōu méiyǒu zuò tāmén běnlái xiǎng zuò de shì.
“Everyone seems to be doing something different than what they originally wanted to do.”
張：對 啊。
Dùi à.
王：武 敏 原 來 想 做 什 麼？
Wǔ Mǐn yuánlái xiǎng zuò shénme?
張：演 員。
Yǎnyuán.
王：他 現 在 做 什 麼？
Tā xiànzài zuò shénme?
張：司 机。
Sījī.
王：那 太 不 一 樣 了。
Nà tài bù yí yàng le.
張：呂 嶺 原 來 想 做 醫 生。
Wǔ Lǐng yuánlái xiǎng zuò yīshēng.
王：他 現 在 做 醫 生 嗎？
Tā xiànzài zuò yīshēng ma?
張：不, 他 現 在 做 老 師。
Bù, tā xiànzài zuò láoshī.

DIALOGUE 27)

王：他 現 在 做 醫 生。
Tā xiànzài zuò yīshēng.
張：誰 做 醫 生？
Shéi zuò yīshēng?
王：武 穎。
Wǔ Yīng.
張：武 頂 原 來 想 做 醫 生 嗎？
Wǔ Yīng yuánlái xiǎng zuò yīshēng ma?
“Did Wǔ Yīng originally want to become a doctor?”

DIALOGUE 28)

王：他 從 小 就 特 別 崇 拜 白 求 恩 夫。
Tā cóng xiǎo jiù tèbié chóngbài Bái Qiūēn dàiē.
“He has admired Doctor Bai Quen so much since he was a little kid.”
張： 吳穎原來想做醫生？

Wú Yīng yuánlái xiǎng zuò yīshēng？

“Did Wú Ying originally want to become a doctor?”

王： 嗯，他一直想當醫生。

En. Tā yī zhí xǐng dāng yīshēng.

張： 他現在做醫生？

Tā xiànzǎi zuò yīshēng？

“Is he a doctor now?”

王： 嗯。

En.

張： 太好了。

Tāi hǎo le.

“That’s great.”

DIALOGUE 29) (Same as Dialogue 21)

王： 我想跟他們談一點事，三點可以嗎？

Wǒ xiǎng gēn tāmen tán yīdiǎn shì，sān diǎn kěyǐ ma？

“I’d like to talk with him a little bit. Is three o’clock okay?”

張： 三點不行。

Sān diǎn bù xíng.

王： 為什 么？

Wèi shénme？

張： 他們下午要去游泳館。

Tāmen xiàwǔ yào qù yóuyǒngguǎn．

“They are going to a swimming pool in the afternoon.”

王： 那我明天再找他們吧。哎，皮得呢？他還在這兒嗎？

Nā wǒ míngtiān zài lái zhǎo tāmen ba．Āi，Pídé ne？Tā hái zài zhèr ma？

“Then let me come find them again tomorrow. By the way, what about Peter? Is he still here?”

張： 他回美國了。

Tā huí měiguó le．

王： 他回美國了？

Tā huí měiguó le？

張： 是啊，你還不知道嗎？

Shì a，Nǐ hái bù zhīdào ma？

“Yes, didn't you know that?”

DIALOGUE 30)

王： 麥克走了。

Mǎikè zǒu le．

張： 他回美 國了嗎？

Tā huí měiguó le ma？

“Did he go back to the States?”

王： 沒有。 他回 加拿大了。

Méiyǒu．Tā huí Jiānàdà le．

“No, he went back to Canada.”

張： 他回哪國？

Tā huí nā guó？

“Which country did he return to?”

王： 加拿大。 他不是加拿大人嗎？

Jiānàdà．Tā bùshì Jiānàdà rén ma？

“Canada. Isn't he a Canadian?”

張： 是嗎？我一 直以 為他是美國人。

Shì ma？Wǒ yīzhī yǐwéi tā shì měiguó rén．

“Yes, didn't you know that?”

王： “Really? I always thought he was an American.”

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DIALOGUE 31) (Same as DIALOGUE 16)

... 王和张是夫妻。他们要去旅行...
... Wáng hé Zhāng shì fūqī. Tāmen yào qù lǚxíng...
... Wang and Zhang are a married couple. They are about to go on a trip...

王: 你看到照相机了吗?  
Nǐ kàndào zhàoxiàngjī le ma?  
“Have you seen the camera?”

张: 没看到。可是早上我看到你妈妈正在收拾东西。  
Méi kàndào. Kěshì zǎoshang wǒ kàndào nǐ máma zhèngzài shōushí dōngxi.  
“No, but I saw your mom organizing things in the morning.”

... 王注意到墙角有一个盒子...
... Wáng zhùyìdào qiángjiăo yǒu gè hézi ...  
... Wang noticed that there is a box at the corner...

王: 放在那个盒子里边儿了吗?  
Fàng zài nèi ge hézi lǐ biān le ma?  
“Did (she) put (it) in that box?”

张: 我来打开看吧。  
Wǒ lái dǎkāi kàn ba.  
“Let me open it and see.”

... 张打开了...
... Zhāng dǎkāi le...

... Zhang opens (it)...

王: 放在那个盒子里边儿了吗?  
Fàng zài nèi ge hézi lǐ biān le?  
“Did (she) put (it) in that box?”

张: 嗯。  
Èn.  
“Yes.”

DIALOGUE 32) (Same as DIALOGUE 17)

王: 你的这些书都放哪儿?  
Nǐ de zhèixiē shū dōu fàng nár?  
“Where shall I put these books of yours?”

张: 就放在那个盒子里好了。  
Jiù fàng zài nà ge hézi lǐ hào le.  
“It is okay to just put (them) in that box.”

王: 放在那个盒子哪边儿呢?  
Fàng zài nà ge hézi nà biān ne?  
“Where in that box shall (I) put (them)?”

... 看著王拿著的那些书...
... Kànzhe Wáng názhe de nèixiē shū ...  
... Looking at the books that Wang was holding...

张: 那些书都是你的,不是我的。  
Nèixiē shū dōu shì nǐ de, bú shì wǒ de.  
“They are all yours, not mine.”

王: 对。我搞错了。那你书呢?  
Duì. Wǒ gào cuò le. Nà de shū ne?  
“Right, I was mistaken. Then what about your books?”

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Dùi. Wǒ gāocuò le. Nà nǐde shū ne?

张：放在那个盒子里边儿了。
   “(I) put (them) in that box.”

Fàng zài nèi ge hézi lǐ biān le.

DIALOGUE 33)

… 王给张打个电话问李先生的商店怎么走...
… Wáng gěi Zhāng dā ge diànhuà wèn Lǐ xiānshēng de shāngdiàn zěnmé zǒu…
   (… Wang calls up Zhang to ask how to get to Mr. Li’s store...)

张：看到一栋灰色的大楼了吗?
   “Do you see a gray building?”
   Kàndào yīdòng huísè de dàlóu le ma?

王：我看到了。
   “Yes. I see it.”
   Wǒ kàndào le.

张：那就再友谊饭店。
   “Then it is in the Friendship Hotel.”
   Nà jiù zài Yǒuyì fàndiàn.

王：在友谊饭店里边儿吗?
   “Is it inside the Friendship Hotel?”
   Zài Yǒuyì fàndiàn lǐbiān ma?

张：嗯。
   “Yes.”
   En.

… 电话杂音很大…
… Diànhuà záyīn hěn dà…
   (… The static on the phone is loud…)

王：什么?
   “What? (What did you say?)”
   Shénme?

张：在友谊饭店里边儿。
   “It is inside the Friendship Hotel.”
   Zài Yǒuyì fàndiàn lǐbiān.

DIALOGUE 34)

… 张要去李先生的办公室。张给王打个电话问怎么走...
… Zhāng yào qù Lǐ xiānshēng de bìngshì. Zhāng gěi Wáng dā ge diànhuà wèn zěnmé zǒu…
   (… Zhang is planning to go to Mr. Li’s office. He calls up Wang to ask how he can get there...)

王：你找到友谊饭店了吗?
   “Did you find the Friendship Hotel?”
   Nǐ zhǎodào Yǒuyì fàndiàn le ma?

张：嗯。
   “Yes.”
   En.

王：那你差不多找到了。
   “Then, you are almost there.”
   Ná nǐ chàbùduō zhǎodào le.

张：在友谊饭店里边儿?
   “Is it inside the building?”
   Zài Yǒuyì fàndiàn lǐbiān?

王：不，不。
   “No, no.”
   Bù, bù.
張：在友誼飯店哪邊兒？
Zài Yǒuyì fàdiàn nàbiān？

王：在友誼飯店後邊兒。
Zài Yǒuyì fàdiàn hòubiān.

“(Then) where is it with reference to the building?”

DIALOGUE 35)

“What is today’s special?”

王：今天的特色菜是什麼？
Jīntiān de tèsecái shì shénme？

張：今天的特色菜是花生豬肉煲。
Jīntiān de tèsecái shì huāshēng zhūròubāo.

“Today’s special is peanut pork casserole.”

王：今天的特色菜是花生豬肉煲？
Jīntiān de tèsecái shì huāshēng zhūròubāo？

張：是。
Shì

“Yes.”

王：不是魚香肉絲嗎？
Bùshì yúxiāngròusī ma？

張：噢，我去問一下。
Òu，wǒ qù wèn yīxià.

“Isn’t it fish flavored shredded pork?”

張：今天的特色菜是花生豬肉煲嗎？
Jīntiān de tèsecái shì huāshēng zhūròubāo ma？

“Is today’s special peanut pork casserole?”

王：小明請到他家做客。
Xiǎomíng qǐng dào tā jiā zuòkè.

張：那你可有口福了。
Nà nǐ kě yǒu kǒufú le.

王：小明做飯很好吃？
Xiǎomíng zuòfàn hěn hǎochī？

張：你吃一吃就知道了。
Nǐ chī yī chī jiù zhīdào le.

王：我沒吃過他做的飯。
Wǒ méi chīguò tā zuò de fàn.

“Xiao Ming invited me home for a meal.”

“Does Xiao Ming cook well?”

“Xiao Ming invited me home for a meal.”

“Does Xiao Ming cook well?”

“You're in for a treat!”

“You will know that once you eat (his cooking).”

“Xiao Ming invited me home for a meal.”

“Does Xiao Ming cook well?”

“You will know that once you eat (his cooking).”

“Xiao Ming invited me home for a meal.”

“Does Xiao Ming cook well?”

“Xiao Ming invited me home for a meal.”

“Does Xiao Ming cook well?”
張：小明做飯很好吃。 Xiao Ming's food tastes very good.
王：那我一定要去嘗一嘗。 Then I must go and have a taste.

DIALOGUE 37)

王和張在說小寧做飯怎樣...
Then Wand Zhang are talking about how Xiao Ning's cooking is...

王：小寧做飯怎麼樣？
Xiao Ning’s food tastes very good.
張：誰說他做得很好吃？難吃死了。
Who says it’s good? It tastes horrible!

DIALOGUE 38)

王：李鈴小的時候愛喝什麼？
What did Li Ling like drinking when young?
張：牛奶。
Milk
王：什麼？
What?
張：李鈴小的時候愛喝牛奶。
Li Ling liked drinking milk when he was little.

DIALOGUE 39)

王：李明小的時候愛喝牛奶嗎？
Did Li Ming like drinking milk when he was young?
張：他家以前在農場，所以...
He used to live on a farm, so…
王：李明小的時候愛喝牛奶？
Li Ming liked drinking milk when he was little?
張：是，所以他每天都喝。
Yes, so he drank milk everyday.
## APPENDIX B SUBJECT INFORMATION

Appendix B provides the demographic and language information about recruited subjects.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Gender</th>
<th>Age</th>
<th>Education / Job</th>
<th>Birthplace</th>
<th>Native Dialect</th>
<th>Yrs in Beijing</th>
<th>Dialect / Foreign Language Ability **</th>
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** Foreign language ability indicates being able to speak foreign language(s) and does not count having learned English at middle/high schools. Most subjects have studied English (and/or French / Korean / Russian) at school. But none reported being able to speak them fluently.
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