An Overview of The Phonetics of Northeastern Mandarin Dialect

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1. Introduction:

1.1. Background & Classification

Northeastern Mandarin is a Mandarin variation spoken mainly in Northeastern China and partial regions in inner Mongolia in northern China. Northeastern Mandarin is classified as a separate dialect group from Beijing dialect by the Language Atlas of China (1989). According to Yan (2006), the estimated speakers around 1987 was 82 millions and 1.2 billions speakers according to statistics by the Chinese government. There are a lot of sub variations within Northeastern Mandarin, since the Northeastern Region refers to the whole Liaodong Peninsula, which has

Map 1. Northeastern Mandarin Speakers Distribution

three provinces: Liaoning Province, Jilin Province and Heilongjiang province. Previous dialectology researchers have recorded different variations in various cities and villages, and

each variations has varying levels of differences, but they generally share a lot of common features. In this specific study, researches and measurements are mainly done on speakers from Shenyang, Liaoning, which is the most commonly mentioned variation of Northeastern Mandarin.

1.2. History & Media Image

The Northeastern dialect has a large population of speakers, but it is actually a relatively young variation. Mandarin was first brought to the Northeastern region during the early Qing dynasty (Simmons, 2016), and before the entrance of Mandarin, the region was mainly inhibited by Tungustic people. A diversity of languages were spoken, including Manchu, Korean, Nanai language, or even the extinct Khitan language from 4th to 13th century. As the origin region of the Qing dynasty, Northeastern China remained a predominant Manchu speaking region during the Qing dynasty, and Northeastern Mandarin passed down a lot of Manchu loanwords in daily vocabularies. Besides the native Manchurians, during the 19th and 20th century, there were rush of Han people migrating to Northeastern China, which is usually referred as “Chuang Guandong (Crashing into Guandong)”, the Han population and the dialects of Mandarin they spoke had a great impact on the evolution of the Northeastern Mandarin.

After the Japanese Invasion of Manchuria in 1932, a puppet empire, Manchukuo, was established in Northeastern China. The colonization period of Northeastern China brought Northeastern Mandarin in contact with Japanese, and a lot of the loanwords are still in use till today. After the founding of the People’s Republic of China, the three provinces of Northeastern China was the

first region in China to industrialize with the help of the Soviet Union. With the flourishing economy due to the heavy industry development, the region was named as “the Republic’s eldest son (共和国长子)”. Russian was employed as a second language widely taught in schools, which brought Russian loanwords.

Entering the 1990s, Northeastern Mandarin was brought to wider audiences throughout the country by Xiaopin (小品) comedy artists, that the dialect was used to present the life of optimistic, studious and un-educated peasants from small villages. The art form brought vase media exposures of Northeastern Mandarin, yet the dialect is somehow associated with certain stigmatized images due to the economic recessions in the past 20 years. Nowadays, Northeastern Mandarin is still popular on social media, that it is perceived as “comedic” “funny” and “unprofessional”.

1. 3. Purpose of the research

The purpose of this research is to dive deeper into the phonetics and acoustic of the Northeastern Mandarin. Most of the past researches are done using the Chinese dialectology framework, and not a lot of phonetics investigations were done on this dialect. Therefore, through this research, specific phonetics features like vowel quality and certain consonants will be measured, analyzed and compared with experimental methodologies.

2. Methodology:

Six native speakers of both Northeastern Mandarin and Standard Mandarin, 3 females and 3 males were chosen to record with a Zoom H4n Recorder in the Odegaard library sound studio, at a sampling rate of 44.1 kHz, and a bandwidth of 16 bits. All six speakers are selected from the same city, Shenyang. The recordings are captured in WAV file formatting and transferred to Praat.

Formant Settings:

- Formant ceiling (Hz): 5500
- Number of formants: 5
- Window Lengths (s): 0.25
- Dynamic Range (dB): 30

Pitch Settings:

- Pitch range (Hz): 75.0 - 500.0
- Analysis method: autocorrelation

The speakers are given a randomized word list of 92 words. In the first round, the participants were asked to read with Standard Mandarin, and in the second round, the participants were asked to read with Northeastern Mandarin. The word list is compose of two-syllable words, and 21 words were selected for vowel quality measurement.

For the vowel quality measurement, the first and second formants were extracted and plotted using excel. Monophthongs are measured at the 50% of the vowel, but for the dynamic vowel

quality of diphthongs and triphthongs, formants are measured at the stable point before the formant movements within the diphthongs and triphthongs instead of the 33%, 50% and 66% measurement, since the 33%, 50% and 66% measurement produced confusing results.

Tones and consonants are analyzed qualitatively through spectrographic analysis. In the following passages, Northeastern Mandarin will be referred as NEM.

3. Vowel Quality

3.1. Monophthongs

In previous researches done on Standard Mandarin, there are controversies on Standard Mandarin phonemes and their allophones, especially surrounding the mid vowel [ə]. In Fu (1956), [ɤ] was proposed as the surface representation, Xu (1980) proposed [E] to represent the cluster of mid vowels in Mandarin. In Wiese (1997), phonological analysis was conducted, and expended the underspecification of mid vowels, which eliminate the need for vowels that do not surface. However, for more accurate measurements in this research, both [ɤ] and [ɝ] are measured along with [i], [y], [u] and [a] in referencing Lee & Zee (2003) measurement for Beijing Mandarin.

All the monophthongs are measured with level tone characters in order to eliminate the tonal impact to the vowel quality. Results for NEM monophthongs are presented in the graphs below.

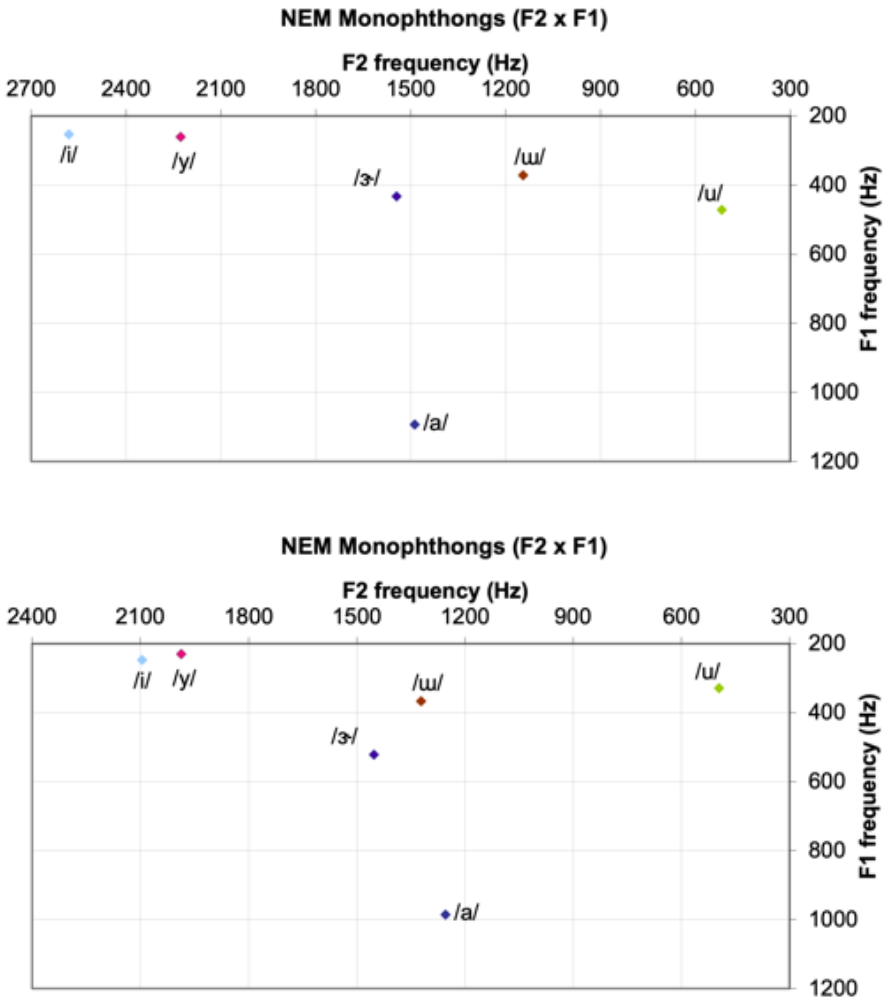

Figure 2. Male speaker NEM monophthongs

3.1.1. Low Central Vowel [a]

Different from the description in Du (2021), the low vowel [a] is observed to be central rather than vowel, which closer to the central-front measurement result from Lee & Zee (2003). The central feature is observed among both female speakers and male speakers.

3.1.2. High Front Unrounded Vowel [i]

Measurements from all speakers show that the high front unrounded vowel in NEM is tensed, which is aligned with the Standard Mandarin high front unrounded vowel. Du (2020) described that the front unrounded vowel in NEM has more laxness and transcribed it with [ɪ], yet the laxness is not observed in the sample collected. However, close syllable laying is observed. The measured characters are all located at the beginning of the two-syllable words, vowels at word-final location may be articulated with more laxness.

3.1.3. High Front Rounded Vowel [y]

The measurements for the high front rounded vowel also indicate that it is a tense vowel [y]. The laxness described in Du (2020) is not observed.

3.1.4. High Unrounded Vowel [ɯ]

For this specific measurement, characters are selected to be considered /ɤ/ in Lee & Zee (2013) and Duanmu (2017). However, the measurement results show that, the realization of the vowel is actually higher than /ɤ/. The high unrounded vowel [ɯ] is observed in 5 out of 6 speakers from the recordings collected, and only one male speaker has /ɤ/ instead of the [ɯ]. There are individual differences observed for this vowel, the [ɯ] of the male speaker in Figure 2 is more central, and the [ɯ] of the female speaker in Figure 1 shows more backness.

3.1.5. Mid-high Central Rhotic Vowel [ɝ]

In NEM, the mid vowel is auditorily rhotic, as rhotic feature is observed in all participants. In addition, the rhotic vowel is observed to be higher than /ɚ/, therefore it is transcribed as raised /ɝ/.

In Duanmu (2007), /o/, /ɤ/ and /ə/ are considered to be underlying forms of [ə], and in Du (2020), /o/ is considered to be a conditional variant of [ə]. In addition, in NEM, [o] is also commonly observed to be articulated with the unrounded back vowel /ɤ/ especially after labials (Duanmu, 2007). In Duanmu (2007, p38), he also described that the vowel quality between /ɤ/ and /ə/ are "so similar that native speakers could hardly determine the difference" in NEM.

3.1.6. High Back Rounded Vowel [u]

Measurements of the vowel [u] shows that it is a high back rounded vowel with tenseness. According to Du (2020, p26), the high unrounded vowel /ɯ/ appears in open syllables (_#) of NEM, and the high back rounded lax vowel /ʊ/ appears before voiced velar nasals. Environments including /ʊ/ are not tested in this study.

3.2 Diphthongs

Eleven diphthongs are measured with level tone characters to eliminate tonal impact on the vowel quality. The eleven diphthongs are transcribed in Standard Mandarin as [ai], [au], [ou], [uo], [ei], [ye], [ie], [ia], [ua], [uə] and [iu] in Lee & Zee (2013). However, the results from the measurements show different patterns, and in this research, diphthongs that show different

patterns are transcribed according to their vowel quality presented in the F1 and F2 vowel plotting graph.

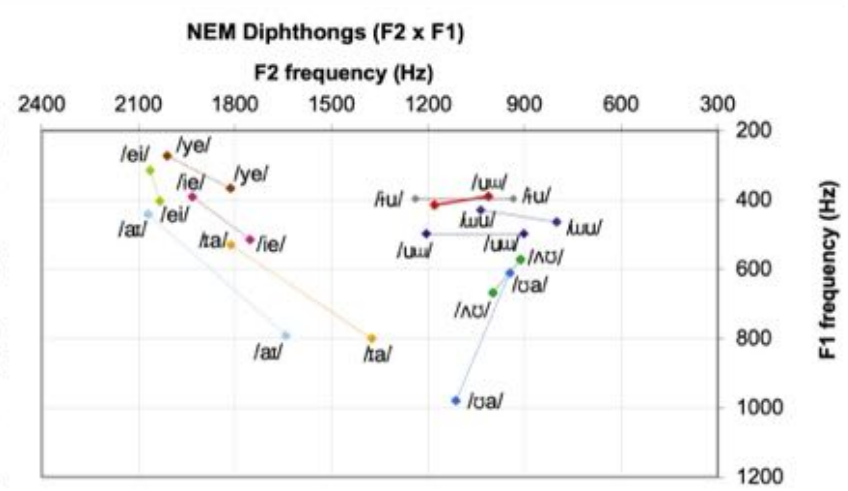

Figure 3. Male speaker NEM diphthongs

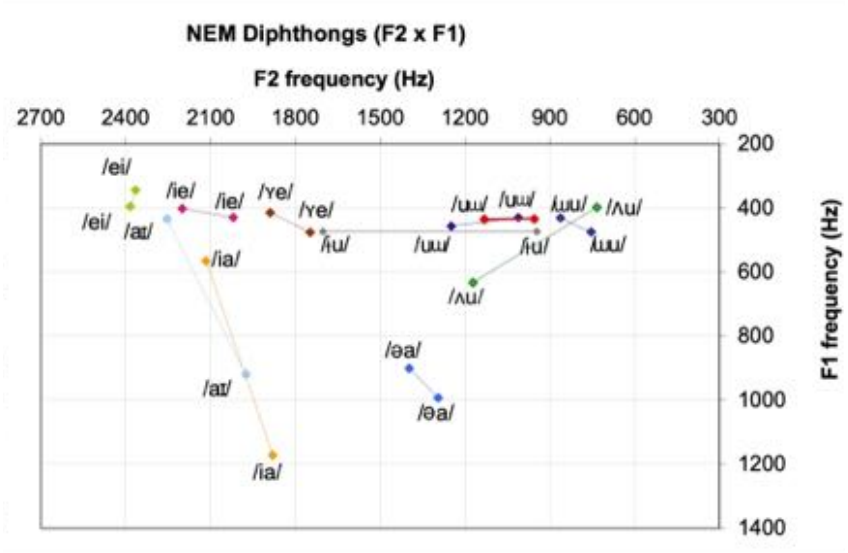

Figure 4. Female speaker NEM diphthongs

The measurement results for diphthongs show more individual differences, since each speaker has their own preference pronouncing words.

3.2.1. Monophthongized raise of /ei/

The diphthong /ei/ shows different direction of formant movement in the two graphs above since the formant movements are relatively small observed among the recording samples. The word measured is 黑色 /xei55sɯ51/, and among all speakers, a monophthongized raise is observed. Different from Beijing Mandarin /ei/ as presented in Lee & Zee (2013), the /ei/ in NEM should be considered as a minor diphthong, and this may due to the really brief /e/ and the little movement.

3.2.2. Different realization of /ua/ and /au/

In the two figures showing above, the /ua/ and /au/ are plotted in very different places. The word used to measure the diphthong /ua/ is 花 /ʍa55/ or /xua55/, the male speaker for figure 3 shows formant movement from /ʊ/ to /a/. However, for the female speaker shown in figure 4, less formant movement is observed, and when listening to the recording repeatedly, it sounds like a mid central to low vowel transition followed a rounded glide, and the selected vowel does not appear to have rounding features. In other four speakers, similar diverging patterns are observed.

In the measurement for the diphthong /au/ as transcribed by Lee & Zee (2013), the formant data extracted from Praat show that the on-glide of the diphthong is more mid back than low central. The more accurate transcriptions for the diphthong /au/ in NEM should be /ʌʊ/ as in figure 3 or /ʌu/ as in figure 4.

3.2.3. Diphthong with the /ɯ/

For the diphthongs /uo/, /ou/ and /uə/, both figure 3 and figure 4 shows pattern that /o/ and /ə/ are realized as /ɯ/ as discussed in the previous section. The off-glide of /uo/ shows a movement pattern towards central instead of mid back vowel /o/ as described in Lee & Zee (2013). The more accurate transcription for /uo/ in NEM should be /uɯ/. Similar pattern is also observed in the on-glide of /ou/, that the more accurate transcription in NEM should be /ɯu/. In figure 4, the formant movement of /uə/ is almost identical to /uɯ/, that it should also be transcribed as /uɯ/.

3.2.4. The centralized /i/

In the diphthong /iu/, different levels of centralization of the vowel /i/ is shown in both figure 3 and figure 4. The high back rounded vowel also shown to have more laxness, therefore the diphthong /iu/ should be transcribed as /iʊ̈/.

Other individual differences are observed among speakers, for example, in figure 4, the high front rounded vowel in /ye/ has more laxness compare to figure 3, and the low vowel in /ai/ and /ia/ is more central compare to the low vowel in figure 3.

3.3. Triphthongs

Four triphthongs are measured with level tone characters. The four triphthongs are /iau/, /uai/, /iou/ and /uei/ as transcribed in Lee & Zee (2013). The results of the measurement shows different positions for the formant movement, and different transcriptions are formulated according to the F1 & F2 graph.

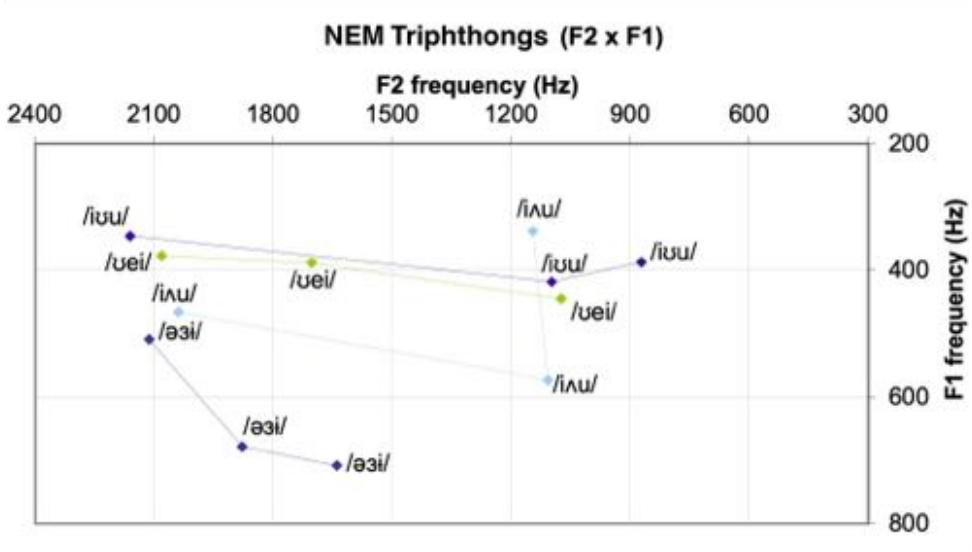

Figure 5. NEM Triphthongs

3.3.1. Fronting of /uai/

The triphthong /uai/ shows a completely different formant movement pattern from that of Beijing Mandarin as described in Lee & Zee (2013). The fronting of the triphthong is transcribed as /əɛɪ/ according to figure 5. The triphthong is measured in the word 摔倒 /ʂwaɻ55tɑʊ̯214/, and the retroflex fricative in front of the triphthong and the voiceless stop after the triphthong result in the overall fronting of the triphthong. Therefore the plotted position of the triphthong /əɛɪ/ is different than expected. The fronting is also observed in the measurements of the other speakers.

3.3.2. /iʊu/, /ʊei/ and /iʌu/

For the other three triphthongs /iʊu/, /ʊei/, and /iʌu/, all speakers show the same formant movement patterns. The triphthong /iou/ shows a less drastic movement from the measurement in Lee & Zee (2013), which the mid round back vowel is centralized and raised, therefore it is transcribed as //iʊu/ in this case. In the triphthong /iau/, the low vowel is raised, therefore /ʌ/ is

used for transcription. Similarly, the /u/ in /uei/ shows more laxness as shown in figure 5, thus /ʊ/ is used for transcription.

4. Consonants

4.1. Phonemic Inventory

	Labial	**Denti-alveolar**	**Retroflex/ Post-Alveolar**	**Alveolo-palatal**	**Velar**
Plosive	p pʰ	t̪ t̪ʰ			k kʰ
Nasal	m	n̪			ŋ
Fricative	f	s̪	ʃ ʐ	ɕ	x
Affricate		ts̪ ts̪ʰ	tʃ tʃʰ	tɕ tɕʰ	
Approximant		l̪			

Table 1

4.1.1. The adaptation of retroflex sibilants

The phonemic inventory of NEM is really similar to Standard Mandarin, especially among speakers of younger generation. Different from the lack of /ʃ, tʃ, tʃʰ/ as described in Song (2017), the recordings collected from participants actually include all phonemes that presented in Standard Mandarin as shown in Table 1. However, despite the fact that these young participants are more familiar with Standard Mandarin in an International context, /ʃ, tʃ, tʃʰ/ and /ʦ̱, ʦ̱ʰ, ʂ̱/ are free variations among NEM speakers in the northeastern region (Du, 2021, p15). According to Song (2017), regions southern from the Huaihe river (淮河) — Taibai mountain (太白山) line, retroflex almost disappear, yet regions northern from the line, there are different distributions of

the retroflex sibilants and denti-alveolar sibilants. Song (2017) described that the variation in Liaoning province to be more complex since the province's population consist of people not only local to Liaoning, but also employment immigrants from other provinces in Northeastern China. However, older generation tends to use only the denti-alveolar sibilants, as the younger generation has adapted retroflex sibilants into their phonemic inventories (Song, 2017, Table 1).

This pair of free variation is now found to have more complicated distributions among speakers. When going through videos on Youtube of speakers from the same region, different usages of sibilants are observed. Some speakers use only the denti-alveolar sibilants, and some speakers use only the retroflex sibilants. There are also conditions when the speaker hyper-corrects the sibilant usage, which result in the malposition of the denti-alveolar and retroflex sibilants.

4.1.2. Dentalized alveolar consonants

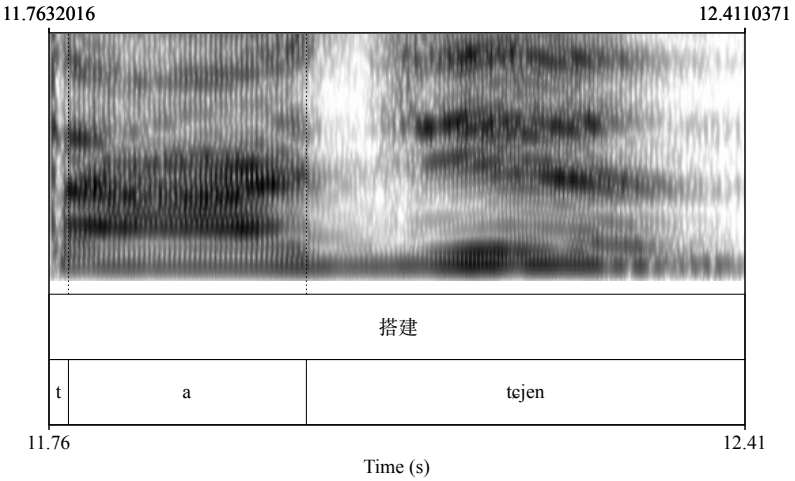

Figure 6. Denti-alveolar stop in NEM

During the recording, participants were asked whether they put their tongue on the back of their teeth or on the alveolar ridges when pronouncing alveolar consonants. All 6 speakers responded "back of their teeth". Therefore, the alveolar consonants, including /t̪, t̪ʰ, n̪, s̪, l̪/ are transcribed as denti-alveolar with a dental diacritics. In Du (2021), only the alveolar nasal and approximant are described as denti-alveolar, but in this study, the dental features is also observed in stops and fricative.

4.1.3. Fronting of the retroflex sibilants

In Lee & Zee (2013), the retroflex fricatives are transcribed as post-alveolar fricatives. Similar pattern is also observed in the recordings. 4 out of 5 participants responded that they feel like the fricative in 沙子 /ʃat͡sʐ̪/ is the same as in "share" in English. Therefore, the retroflex fricatives are transcribed with post alveolar fricatives.

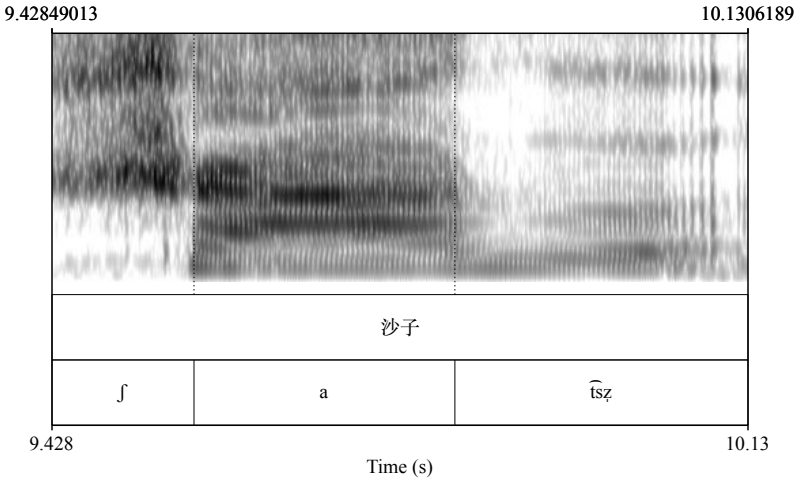

Figure 7. Post-alveolar fricative in Standard Mandarin

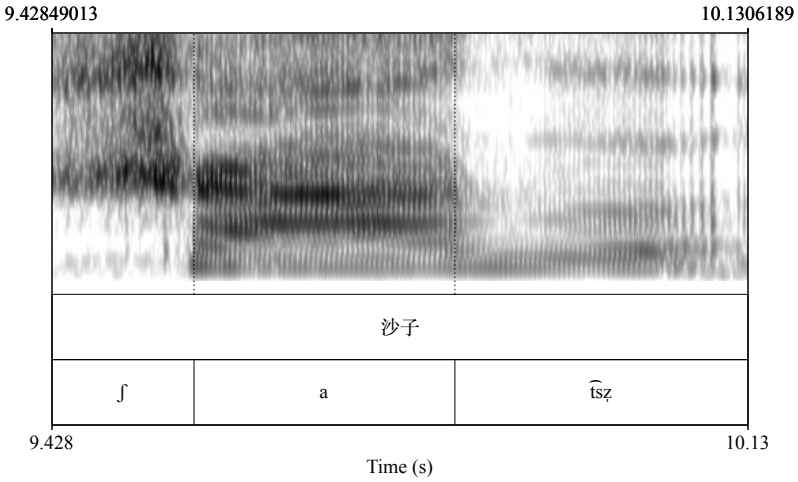

Figure 8. Post-alveolar fricative in NEM

In Figure 8, the broad peak is around 3000 hertz, and the 3 and 4 formant transition show typical post-alveolar spectrographic pattern.

4.1.4. Nasal epenthesis

In some variations of NEM, nasal epenthesis is observed in words with vowels in word initial. According to Du (2021), the epenthesis of denti-alveolar nasal /n̪/ is usually observed in older generation NEM speakers, yet the feature is preserved in many frequently used vernacular phrases like 大鹅 /t̪a51n̪ɯ35/ (big goose).

1) 鹅 /ɤ35/ > /n̪ɯ35/ goose

2) 安 /an55/ > /n̪an33/ quiet, safe

3) 袄 /aʊ̯214/ > /n̪aʊ̯214/ jacket, robe

However, no data of the denti-alveolar nasal epenthesis is observed among the recordings.

4.1.5. The absence of /ʐ̩/

According to Song (2017), there wasn't the phoneme /ʐ̩/ in NEM before close contact with standard Mandarin. The middle Chinese initial 日 /ʐ̩51/ merged with 来 /laɪ35/ initial, 喻 /y51/ initial and 影 /iŋ214/ initial, which resulted in two-way distributions of characters with the phoneme /ʐ̩/.

1) /ʐ̩/ > /l/:

扔 /ʐɤŋ55/ > /l̪ɯŋ33/ to throw

乳 /ʐu214/ > /l̪u214/ milk

2) /ʐ̩/ > /j/

肉 /ʐoʊ̯51/ > /jɯu51/ meat

热 /ʐɤ51/ > /jɛ51/ hot, warm

However, among the data collected from the recordings, this feature is not observed. This feature is preserved more in the speech of older generation or in casual conversations, as Standard Mandarin is implemented in general education.

4.2. Other particular features observed in recordings

4.2.2. Fronting of the alveolo-palatal sibilants

Among the data collected from the recordings, one female speaker pronounced words that start with a alveolo-palatal fricative /ɕ/ with a denti-alveolar fricative /s̪/, with an emphasis on the dental feature. This speaker has the fronting of the alveolo-palatal fricative feature in both NEM

and Standard Mandarin. However, this feature observed is actually common among vernacular speech.

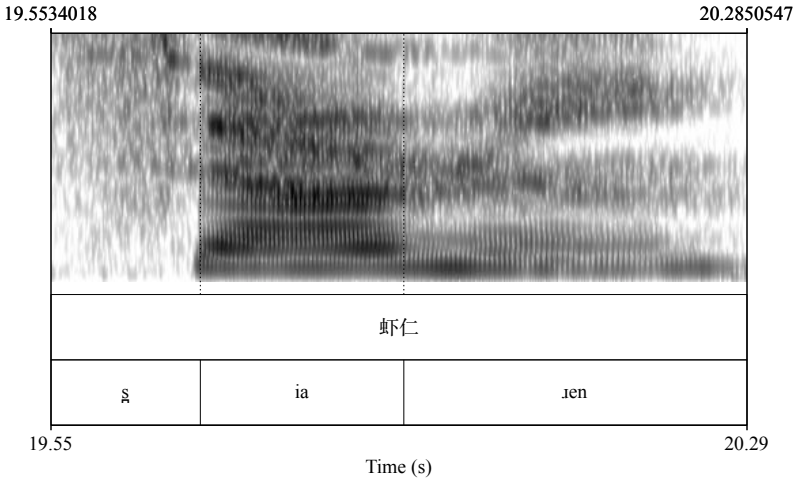

Figure 9. Denti-alveolar fricative in NEM

4.2.3. Uvular trill /R/

Among the data collected from the recordings, a uvular trill /R/ is observed in a male speaker recordings. The original velar fricative /x/ shows the pattern of a trill, that it is realized as a uvular trill. This feature is observed to be in all of the words with velar fricative /x/ he pronounced. The feature could be a result of hyper-articulation since the participant is being recorded. However, this is a commonly observed feature among NEM speakers, especially male speakers.

4.2.4. Coarticulations

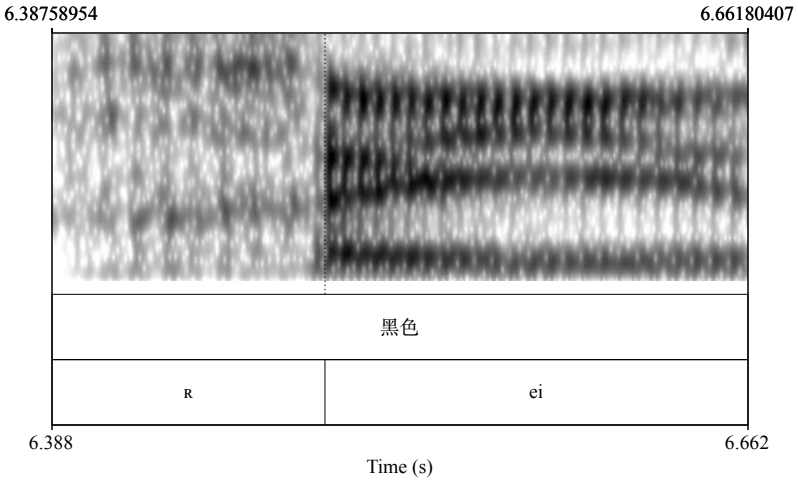

Figure 10. Uvular trill

Coarticulations are commonly observed in the NEM recordings, comparing to the clear articulation of each phoneme in Standard Mandarin, the NEM words are usually pronounced with more reduction. Acoustic features of the coarticulation is observed through spectrograms. In figure 11, the frication noise is less obvious than in figure 12, and there are also no clear boundaries between the frication noise and the following vowel. The ending of the previous vowel also blends into the frication noise. Similar patterns are observed among the NEM recordings of all participants.

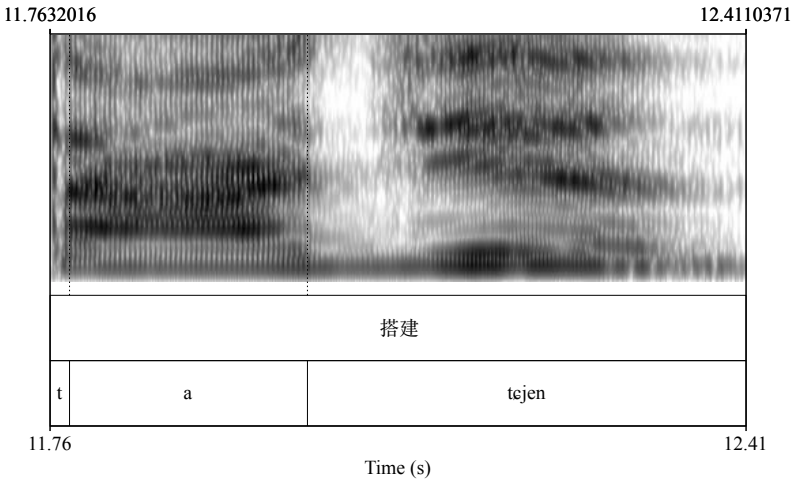

Figure 11. Coarticulation in NEM

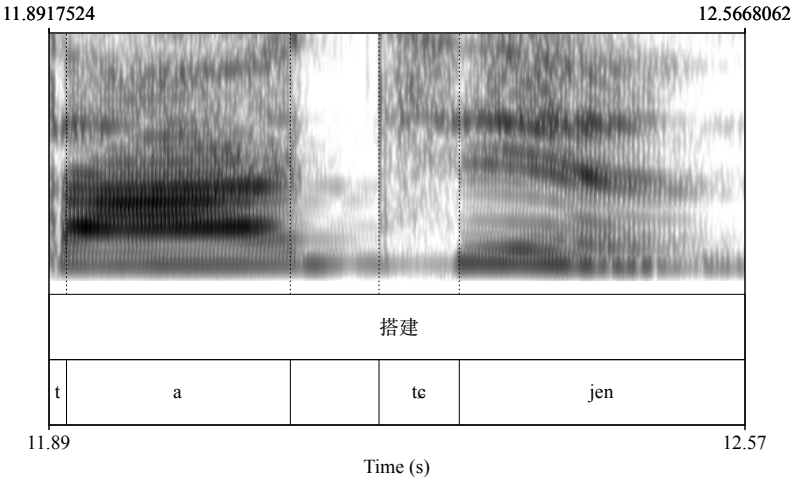

Figure 12. Clear articulation in Standard Mandarin

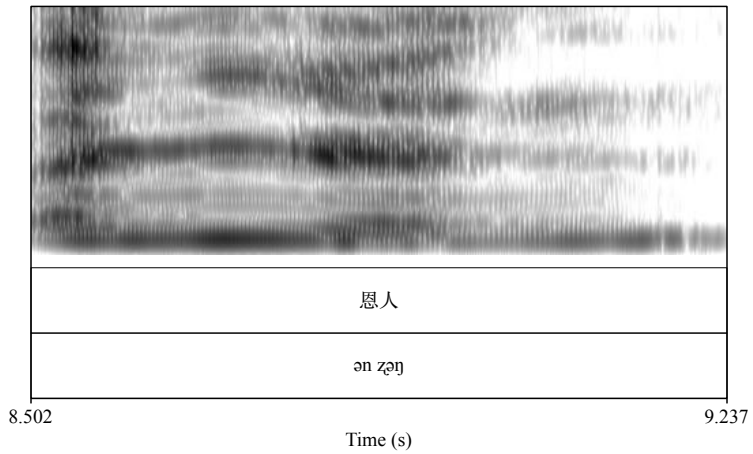

Figure 13. Coarticulation in NEM

Figure 13 provides another example of coarticulation in NEM.

5. Tones

Since NEM is a Mandarin variety, it also has four tones: a level tone, a rising tone, a fall-rise tone and a falling tone. In Song (2017), tones in NEM are described in two different criteria, pitch and pitch contour. Song (2017) described NEM tones to have generally lower pitch than

standard Mandarin, and the pitch contour are generally more flat compare to standard Mandarin. The different tone sandhi rule is also a noticeable feature of NEM.

5.1. NEM tones

Comparing to Standard Mandarin, NEM tones have contours that are more flat, and tones are also realized in lower frequencies than in Standard Mandarin.

5.1.1. Level tone

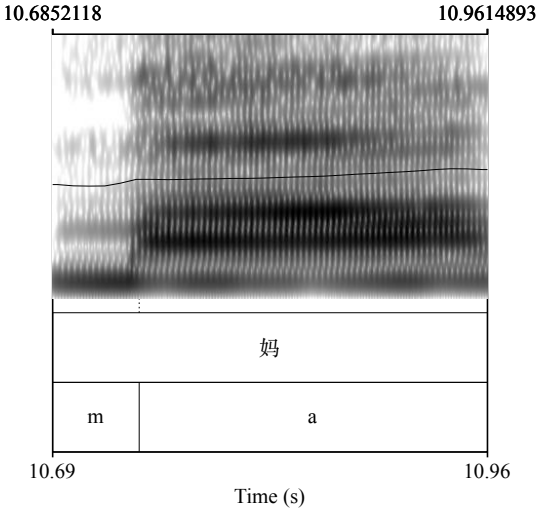

Figure 14. Level tone in Standard Mandarin

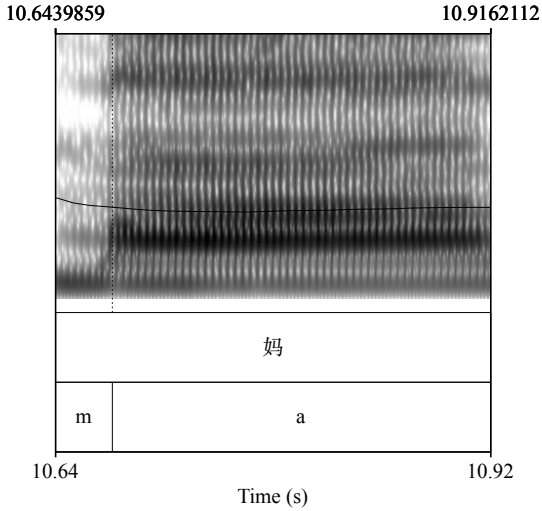

Figure 15. Level tone in NEM

	Male speaker 1	Male speaker 2	Female speaker 1	Female speaker 2
NEM mean frequency	100.2	136.5	215.5	217.3
Standard Mandarin mean frequency	117.3	228.9	233.3	270.1

Table 2. Mean frequency of level tone comparison between NEM and Standard Mandarin

The lower level tone in NEM is the most prominent tonal feature comparing from Standard Mandarin. In previously collected data on NEM lower level tone impact on vowel duration (Zhou, 2022), the mean frequency extracted from the NEM is lower than standard Mandarin as shown in Table 2.

The pitch contour comparison in figure 14 and figure 15 also shows that NEM level tone is indeed lower than that of Standard Mandarin. In Song (2017), NEM level tone is classified as 44 instead of the Standard Mandarin 55 using the tonal contour system.

5.1.2. Rising tone

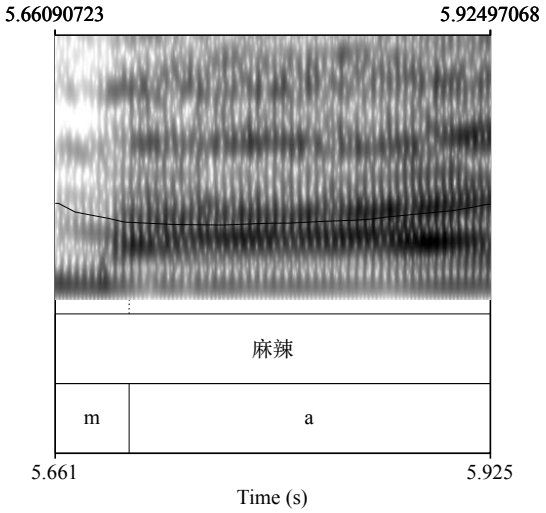

Figure 16. Rising tone in Standard Mandarin

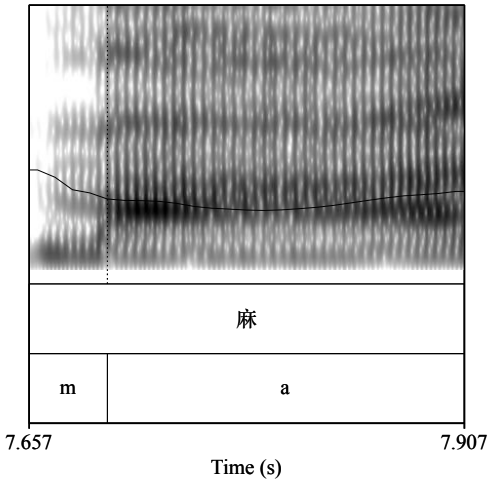

Figure 17. Rising tone in NEM

In Song (2017), NEM rising tone is classified as 24 instead of 35 using the tonal contour system since NEM tones have generally lower frequencies. Figure 16 and figure 17 are taken from the recordings of a female participant. In figure 16, the lowest frequency is 194 hertz, and the highest frequency is 228 hertz. However, in figure 17, the lowest frequency is 170 hertz, and the

highest frequency is 199 hertz. Similar pattern is observed in the recording data of other participants as well: rising tone in NEM has generally lower frequency, and the extent of the "rising" is also less drastic than that of Standard Mandarin. Therefore, instead of 35, using 24 as described in Song (2017) can represent NEM rising tone more accurately.

5.1.3. Falling and rising tone and creaky voicing

In NEM, the low frequency part of falling rising tone and falling tone are usually presented as creaky voicing, especially in the falling rising tone. The creaky voicing feature is found in the NEM recording samples of all participants, but not prevalent in the Standard Mandarin samples.

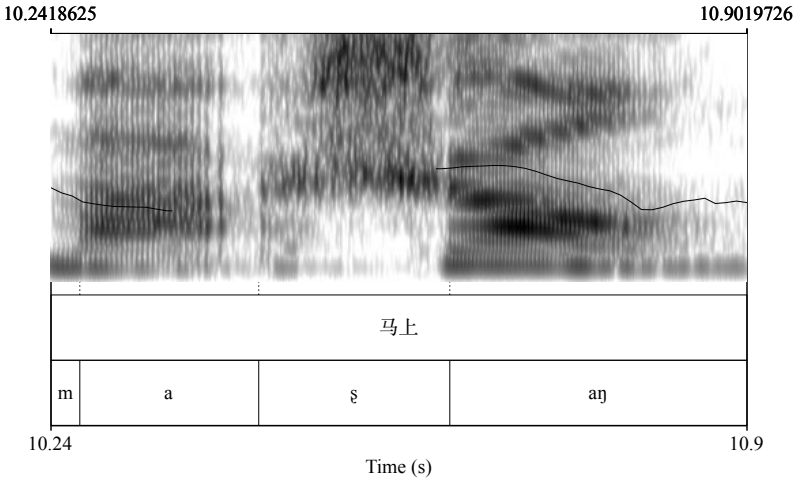

Figure 18. Falling-rising tone in Standard Mandarin

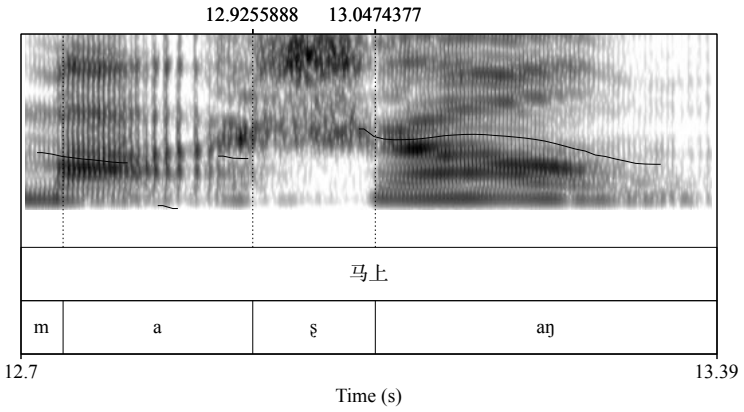

Figure 19. Falling-rising tone in NEM

Among NEM recordings, falling-rising tones are realized with creaky voicing, as shown in figure 18. Among the Standard Mandarin recordings, falling-rising tones are realized as falling tones, as shown in figure 19.

5.1.4. Falling tone

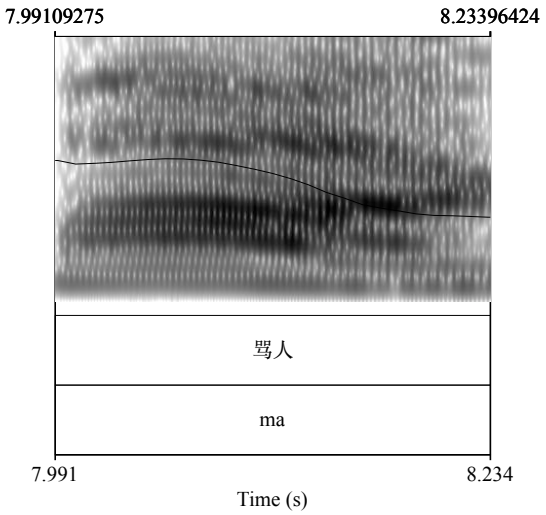

Figure 20. Falling tone in Standard Mandarin

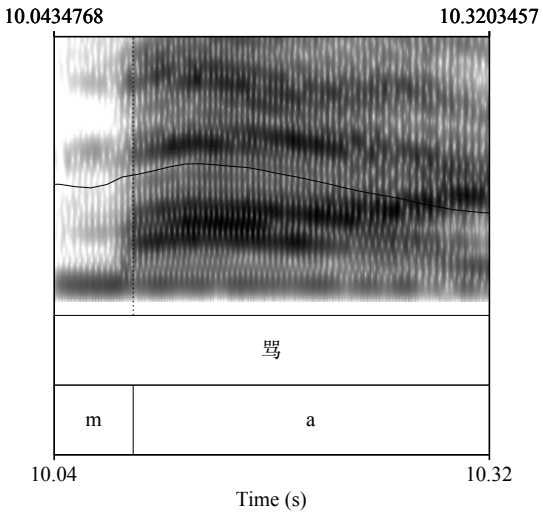

Figure 21. Falling tone in NEM

Both figure 20 and figure 21 are taken from the recordings of a female participant. In figure 20, the highest frequency is 303 hertz, and the lowest frequency is 210 hertz. In figure 21, the highest frequency is 295 hertz and the lowest frequency is 231 hertz. Similar pattern is observed in recording data of all participants. In song (2017), the falling tone is represented as 52 instead of 51, which describe the NEM falling tone more accurately.

5.2. Tone Sandhi Rules

The tone sandhi rules in NEM is really different from Standard Mandarin, and it's also a really noticeable features of NEM. NEM phrases that have different tone sandhi patterns from Standard Mandarin are made into memes and are widely spread among the internet.

5.2.1. Tone sandhi rule for rising tone

The first rising tone character of the NEM phrase changes to falling tone before falling or falling rising tone, as the second character of a NEM phrase changes to low falling tone. However, this tone sandhi rule is not applicable for all words that shares the same tonal patterns, this tone sandhi rule is only preserved in some frequently used phrases, and some characters. One

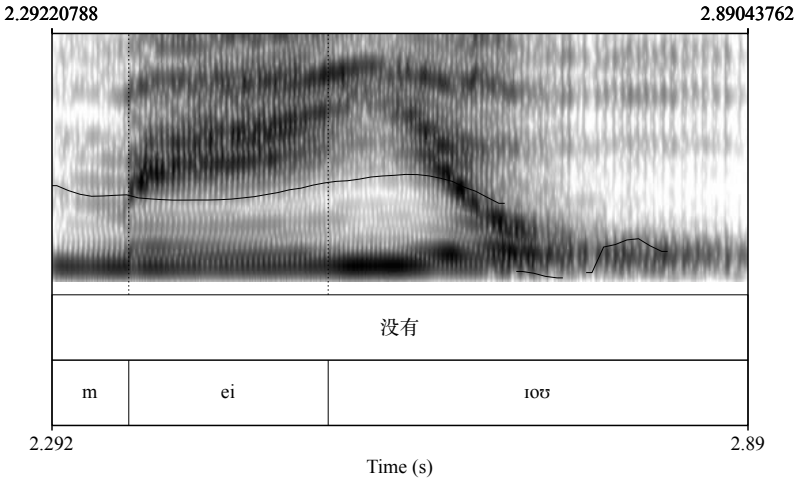

Figure 22. Tone Sandhi in Standard Mandarin

commonly used phrase is 没有 /mei35ioʊ214/ ("none, don't have") as shown in Figure 22. In NEM, the rising tone 没 /mei35/ is realized as falling tone, as the fallowing falling rising tone is changed to simply falling tone. This phrase is a popular meme phrase, and the NEM vernacular pronunciation is represented in orthography as "妹有 /mei51ioʊ21/" on the internet. Similar

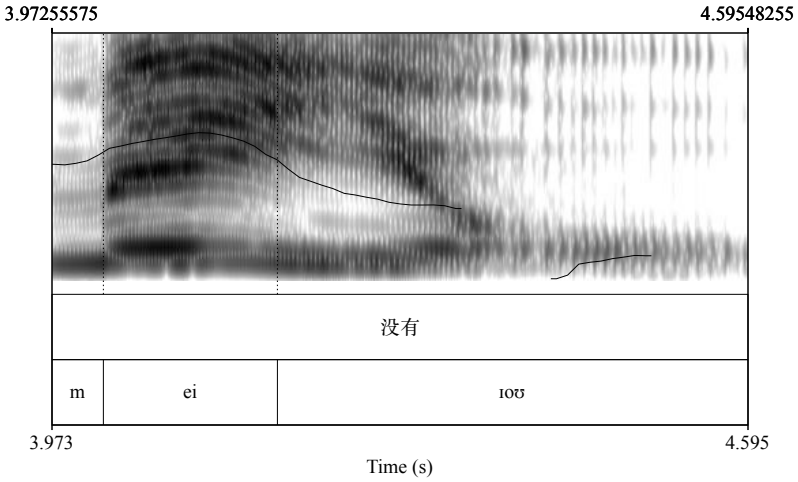

Figure 23. Tone Sandhi in NEM

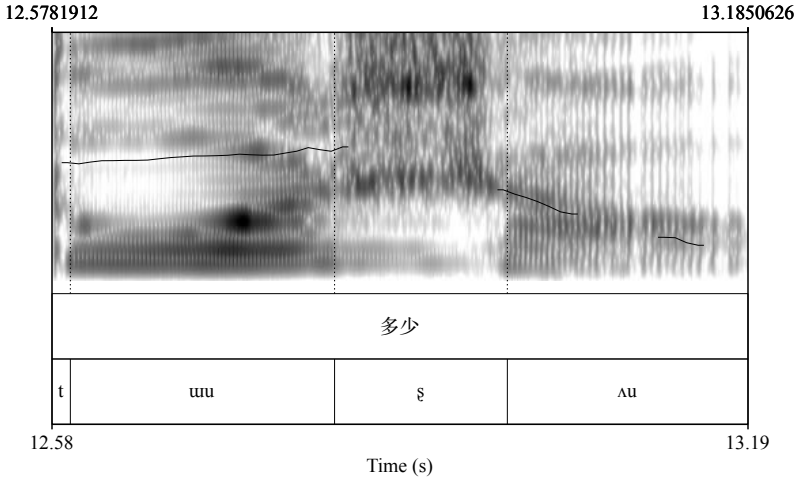

Figure 24. Tone Sandhi in Standard Mandarin

pattern in found in other phrases: 还有 (“in addition”) /xaɪ35ioʊ214/ > /xaɪ51ioʊ21/, 别整 (“don’t do, stop messing around”) /pjɛ35t͡ʂɤŋ214/ > /pjɛ51t͡ʂɯŋ21/.

5.2.2. Tone sandhi rules for level tone

The level tone first character or the NEM phrase changes to rising tone before falling or falling rising tone, the second character of the NEM phrase following the rising tone changes to low

falling tone. In the phrase 多少 (how much) /tou55ʂʌʊ214/ as shown in figure 24, the level tone first character changes to rising tone in Figure 27. Creaky voicing is also observed in the falling tone part in Figure 25. (The pitch contour in Figure 25 is not accurate because of the creaky voicing)

Another phrase listed below is 八个 (eight [numeral]) /pa55kɯ51/ as shown in figure 26. In NEM, the level tone character changes to a low rising tone as shown in Figure 27. Similar pattern is found in 知道 (“be aware of, acknowledge”) /tʂʐ̩55tɑʊ51/ > /tʂʐ̩24tɑʊ41/.

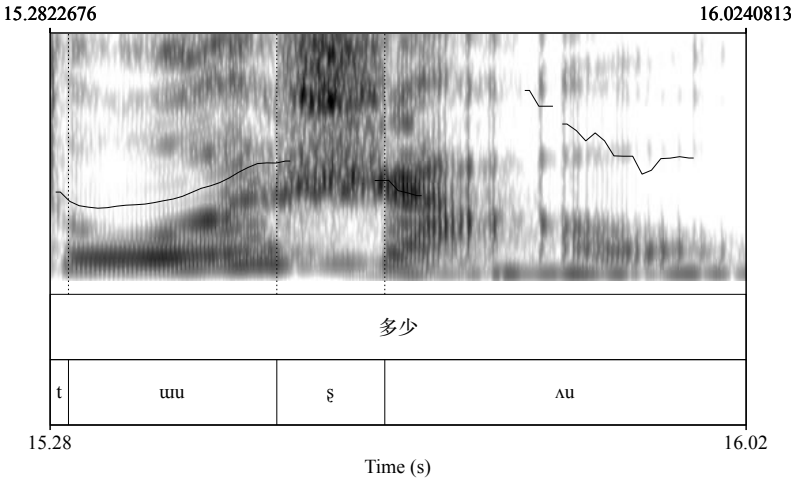

Figure 25. Tone Sandhi in NEM

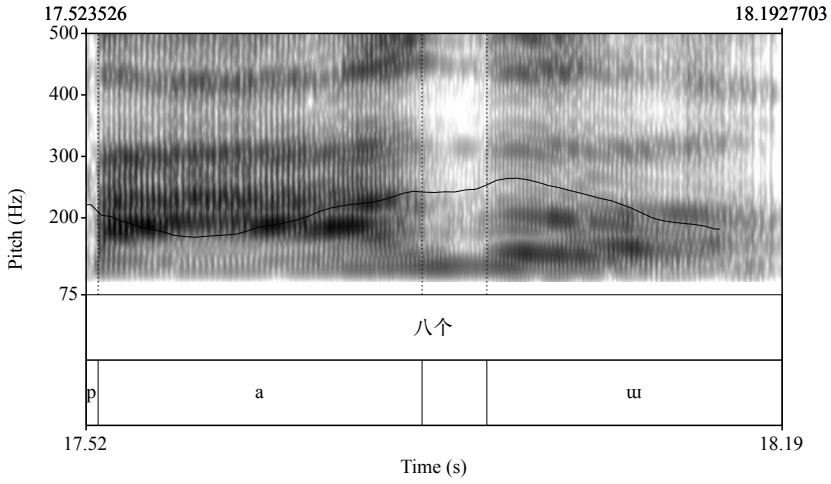

Figure 27. Tone Sandhi in NEM

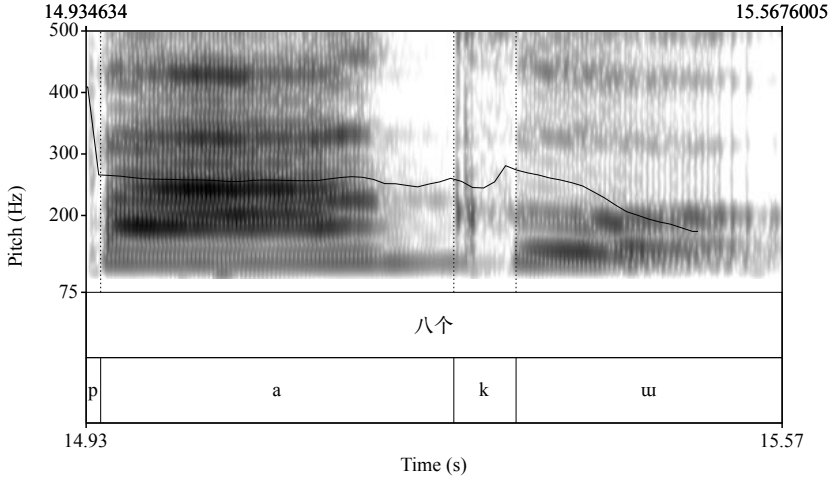

Figure 26. Tone Sandhi in Standard Mandarin

6. Discussion

One thing particular about this research is that all the participants are international students studying in UW. When they were asked to do the recordings first, some of them replied “I don’t know whether I can do this well, because I speak Standard Mandarin here most of the time”. Most of the participants, including the author, would only speak NEM with people who we are familiar with, or people who are also from the Northeastern region. Speaking Standard Mandarin in this diverse environment somehow is a norm to show be more “professional”. In Yang (2014), the author analyzed the language attitude towards both Standard Mandarin and NEM, the results from the survey implies that young professionals from Shenyang think people who speak Standard Mandarin is more likely to success in their career, and more favorable in social context. Among the participants, most of them are usually commented “I don’t think you have an accent” by other people. Some of them also tell stories about how they would start to speak NEM in parties or social events to make other people laugh in order to break the ice. It is interesting that

even in a diverse environment outside of China, the stereotypes that are associated with NEM are still prevalent in almost all social contexts.

3 of the participants (2 female, 1 male) have been studying overseas since high school, they reported a less frequent usage of NEM in their daily life. They have the least prominent NEM features, for example, the free variation sibilants, without hyper articulation during the recording. Only one male speaker speaks NEM on a daily basis, without code-switching in different situations or contexts. Because of the particularity of the participants' backgrounds, the recordings didn't include many of the "stereotypical features" as described on social media or even in other research papers. The vowels are higher than described in Song (2017) and Du (2021), and the NEM consonant inventory also includes all phonemes in Standard Mandarin.

On social media, the discussion about NEM mostly focus on the special vocabularies, which contains a lot of loanwords from different languages since NEM has been in contact with a lot of languages. For example, 沙琪玛 (a crispy noodle dessert), and 嘎拉哈 (lamp bones toy), which are all Manchu loanwords. These loanwords usage is also associated with NEM speakers' social images on social media. These loanwords are also incorporated into art forms like "二人转" and "喊麦", which are all art forms originated from the less prestigious social class that have limited access to education resources. These factors combined constructed this mostly discussed stereotype of Northeastern China — "精神小伙/小妹" and "社会大哥", which refers to the people who didn't finish the 9-year mandatory education, and have low-income jobs. In my

milestone project for sociolinguistics class during fall quarter, a recording of NEM speaker from the website Phonetica was shown to speakers from different regions in China. Most of them rated the speaker as “lower than average education level” in the survey, which somehow reflected the language attitude towards NEM is mostly based on stereotypes.

However, video platforms started to have AI dubbing speakers speaking NEM in corresponding video editing softwares, which makes NEM popular on social media. With more exposure, more and more young NEM speakers are feeling proud of NEM, and the identity behind NEM.

7. Conclusion

The purpose of this study is to provide a more thorough overview the phonetics of Northeastern Mandarin, since there aren’t a lot of existing researches on the phonetics and acoustic descriptions of this variation of Mandarin. The dialect is relatively young, and although really different, it is usually considered to be “close enough” to Standard Mandarin, in addition to the fact that it’s a less prestigious dialect with a really large population of speakers. The above are reasons that make Northeastern Mandarin a marginalized variety in Chinese linguistics studies.

This research is certainly conducted with a lot of limitations, but it provides a lot of specific measurements of the phonemic inventory. For future studies, more speakers that not only from Shenyang should be recorded and analyzed. The age range, social class and occupations of the participants also lack diversity since the participants were selected within University of

Washington. More data should be collected in the entire the Northeastern region, and more diversity within NEM should be acknowledged and researched.

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Appendix:

1. Word List:

1.1. Consonant:

p /pa55/ 八仙过海
p^h /p^h a55/ 趴着
m /ma55/ 妈妈
f /fa55/ 发送
w /wa55/ 挖掘
t /ta55/ 搭建
t^h /t^h a55/ 塌方

s /sa55/ 撒谎
ts /tsa55/ 咂嘴
ts^h /ts^ha55/ 擦玻璃
ʂ /ʂa55/ 沙子
ʧ /ʧa55/ 渣男
$ʧ^h$ /$ʧ^h$a55/ 插画
ɕ /ɕia55/ 虾仁

tɕ /tɕia55/ 加法
$tɕ^h$ /$tɕ^h$ia55/ 掐架
ʅ /ʅən35/ 人民
k /kɤ55/ 歌曲
k^h /k^hɤ55/ 科学
ŋ /aŋ55/ 肮脏
x /xɤ55/ 喝水

h /ha55/: 哈尔滨
l /la55/ 拉手
j /ja55/ 鸭子
ɻ /sɻ55/ 思考
/ʂʅ55/ 诗歌

1.2. Vowels:

i /i55/ 衣服
y /y55/ 淤青
a /ta55/ 搭建*
ɚ /ɚ35/ 儿子
u /u55/ 乌鸦
ɤ /ɤ55/ 婀娜多姿
in /in55/ 音乐

yn /yn5/ 晕倒
an /an55/ 安全
ən /ən55/ 恩人
xuŋ /xuŋ55/ 轰炸
ai /ai55/ 哀伤
au /au55/ 凹凸
ou /ou55/ 欧洲

uo /tuo55/ 多吃
ei /xei55/ 黑色
ye /ɕye55/ 靴子
ie /ɕie55/ 歇着
ia /ɕia55/ 虾仁*
ua /xua55/ 花朵
uə /xuən55/ 昏倒

iu /ɕiuŋ/ 凶险
iau /ɕiau55/ 消失
uai /ʂuai55/ 摔倒
iou /ɕiou55/ 休息
uei /xuei55/ 灰尘

2. Pitch Listing

妈 /ma55/		麻 /ma35/		马 /ma214/		骂 /ma51/	
NEM	Standard Mandarin	NEM	Standard Mandarin	NEM	Standard Mandarin	NEM	Standard Mandarin
217.6	266.6	187.1	210.7	-	-	284.8	297.4
216.1	266.2	185.9	205.7	-	-	291.1	295.4
215.2	266.5	185.4	199.6	-	-	295.1	297.3
214.7	267.2	183.3	198.4	-	-	295.7	299.1
214.4	267.4	178.8	197.1	-	-	293.8	301.6
213.8	268.1	174.6	195.8	-	-	289.5	303.4
213.7	268.1	173.0	195.5	-	-	284.8	302.8
214.7	268.6	171.3	195.2	-	-	279.8	300.0
215.6	269.5	170.4	194.9	-	-	274.8	295.7
215.9	270.3	170.3	195.9	-	-	269.4	289.7
216.2	270.9	172.2	197.8	-	-	263.9	283.9
216.6	271.8	174.1	197.9	-	-	257.7	275.5
217.7	273.2	176.6	199.4	-	-	252.7	268.4
218.4	274.9	180.8	200.6	-	-	247.3	255.2
219.0	276.0	184.4	202.7	-	-	242.9	244.4
220.1	277.5	188.7	208.1	-	-	237.9	235.4
220.5	278.7	192.3	213.3	-	-	231.6	227.1
220.8	280.3	194.6	218.5	-	-	-	222.4
221.1	282.3	196.4	222.9	-	-	-	213.6
221.2	283.6	199.2	228.2	-	-	-	210.5