Prosody, Phonology and Phonetics

Caiyu Wang

Tone Evolution

The Uni- and Multi-Phonational Tone Systems on the Jianghan Plain

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ISSN 2197-8700 ISSN 2197-8719 (electronic)
Prosody, Phonology and Phonetics
ISBN 978-981-97-0001-1 ISBN 978-981-97-0002-8 (eBook)
https://doi.org/10.1007/978-981-97-0002-8

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

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Acknowledgements

'*What are the Four Tones?*' When Wu the King of Liang questioned about the newly-invented concept 'the Four Tones' about 1,500 years ago, his courtier responded, '天子圣哲.' ('Heaven Son Holy Sage', four characters respectively carrying the Four Tones, *Ping, Shang, Qu*, and *Ru*). After that, before the contemporary effort, this question was answered in poetic descriptions, sound symbols, pioneering acoustic representations, and IPA transcriptions of the phonological systems in the survey of Chinese dialects. I realized the question in the summer of 2010 when the co-existence of the uni- and multi-phonational tone systems with their abundant varieties and variations was revealed in my fieldwork on the Jianghan Plain. From then on, I have been thinking about it. I am fortunate to have been guided, supported, and encouraged in the long journey to answer the question.

I am grateful to my supervisor, Prof. Xiaonong Zhu. His Multi-Register Four-Level tonal model distinguishes tones with both phonation type and pitch, which makes the definition of tone systems from the uni- and multi-phonational languages possible. His insight into redefining tones and reconstructing tone evolution on the typological studies of acoustic data inspires and motivates me to scrutinize the raw sound materials and figure out their meanings in the mechanism of ongoing languages.

I express my gratitude to the following professors: Jingtao Sun, Min Zhang, Yuk-man Yiu, Cheng Chang, and Shiheng Wang of the Hong Kong University of Science and Technology; Wei Zheng of the East China Normal University; Phil Rose of the Australian National University; Patricia Keating of the University California, Los Angeles; and Jianjing Kuang and Mark Liberman of the University of Pennsylvania. They directed or enlightened me to interpret speech sounds and conduct quantitative analyses of acoustic materials, when I was a PhD student or a visiting scholar. Profs. Min Zhang and Phil Rose suggested I publish my findings in several steps after my PhD thesis debate in 2015. I highly value the suggestions and am still working on the task now.

I thank the following schoolmates and friends I met in HKUST, UCLA, and UPenn: Ruiqing Shen, Jingfen Zhang, Alex Chi-sing Yim, Ying Hong, Man Fong Lam, Lei Jiao, Yingyi Zhou, Yuyu Zeng, Xi Cun, Qing Lin, Yang Wei, Xiaolei Fan,

Yueyin Liu, Liying Liao, Jing Liao, Ana Engelbert, Jia Tian, and Yipei Zhou. Some of them once were my speakers. These clever and engaging companions help me as a walking database, and they are also models for me to observe and learn in my research and life.

I thank my speakers and liaisons for their warm help and generous sharing in the fieldwork.

I appreciate the professional help from Dharaneeswaran Sundaramurthy and Rebecca Zhu with Springer.

I am indebted to my family for their teamwork in the fieldwork and in the process of writing this book. My father, Prof. Qunsheng Wang, helped me select the investigation places on the Jianghan Plain, my husband drove in the trips, and my mother took care of my daughter for me. I thank them for their love and faith in me. In these years for the studies of the tones on the Jianghan Plain, Victoria has grown from a baby to a healthy and optimistic teenager. I thank her intuition, 'This is a good book,' and her natural adjustment to life with a busy mother.

This research is sponsored by Humanities and Social Science Project of the Ministry of Education of China (2016YJC740066), Research Fund of Zhongnan University of Economics and Law, and Postgraduate Research Grant of the Division of Humanities, HKUST. I gratefully acknowledge the support.

What are the tones on the Jianghan Plain? Why do they sound like these? I thank the people and institutions above for helping me answer these fascinating but knotty questions with this book.

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Chapter 1
Introduction

The Jianghan Plain (江汉平原, Jiānghàn Píngyuán), located in the south-central part of Hubei (湖北省, Húběishěng, Hubei province) in China, is created from the deposition of the sediment brought by the Yangtze River and its main tributary, the Han River (汉水, Hànshuǐ). It is a 'land of fish and rice' historically, and now it is still a main production area for freshwater fish and crops in China. Both the uni-phonational phonological systems and the multi-phonational ones are found on the Jianghan Plain, and the tone systems are complex here. Especially in the five adjacent counties—Songzi (松滋, Sōngzī), Gong'an (公安, Gōng'ān), Shishou (石首, Shíshǒu), Jianli (监利, Jiānlì), and Shayang (沙洋, Shāyáng), the co-existence of the uni- and multi-phonational systems prevails. The book introduces an exploration of tone evolution in these five counties through an acoustic study of their tone systems.

1.1 Research Aim and Subject

Among the five counties, the first four belong to Jingzhou (荆州市, Jīngzhōushì, Jingzhou city) and the last one to Jingmen (荆门市, Jīngménshì, Jingmen city). The phonological systems of the five counties share a lot in common in terms of their initials and finals, but differ in their tones. In *Language Atlas of China* (1987), Songzi, Gong'an, and Shishou are classified into Subgroup Changhe (常鹤片, Chánghèpiàn) and Shayang into Subgroup Chengyu (成渝片, Chéngyúpiàn) of Southwestern Mandarin (西南官话, Xīnánguānhuà, the biggest dialectal group in China), while Jianli is a member of Subgroup Datong (大通片, Dàtōngpiàn) of Gan (赣语, Gànyǔ, the Gan dialects). Uni-phonational systems only apply modal voice to produce speech sounds. When modal voice is made, the glottis operates 'with only moderate adductive tension and moderate medial compression, with moderate longitudinal tension' (Laver, 1980: 111). In addition to modal voice, falsetto and breathy are also applied in the five counties on the Jianghan Plain, and thus the phonological

C. Wang, *Tone Evolution*, Prosody, Phonology and Phonetics,
https://doi.org/10.1007/978-981-97-0002-8_1

systems are uni-phonational (modal voice), di-phonational (modal and falsetto), and tri-phonational (modal, falsetto, and breathy).

The application of different phonations and the varied intensity of the nonmodal phonations among varieties or speakers make the definition of tones in this area a challenge. For example, the Middle Chinese (MC) Ciqing (次清, Cìqīng, a MC phonological group) [Refer to Wang (1967) for the definitions of the MC terms.] and Zhuo (浊声, Zhuóshēng, a MC phonological group) characters are produced by breathy now in southern Jianli, and breathy covers the beginning or the whole process of the production of the syllables. The Ciqing and Zhuo characters sound murky or unclear, and their initials are voiced or voiceless. As for the voiced initials, they are voiced plosives/affricates, implosives, or prenasal plosives/affricates. To define these syllables by segmental features, i.e., by 'voiced aspirated initials', is only a provisional method. Moreover, the pitch height and contour between some corresponding MC groups (e.g., between Ciqing and Quanqing tones) are similar, even though they are produced differently by modal or breathy voice. How to define the multi-phonational tone systems?

Abundant varieties and variations of tones exist in the five counties on the Jianghan Plain. Among different investigation spots or even within the same spot, speakers may differ in their re-categorization of the MC groups, tone numbers, phonation types, and pitch height and contour of the same tonal category. Among the five counties, some tones show the same tone value and contour, but they come from different MC origins. Strong correspondences, however, are found among these tonal varieties and variations. Despite the tone systems being different in terms of their re-categorization of the MC groups and even the tone numbers, some tones with the same MC origins among the five counties show similarities in their tone contours and values. As for the varieties and variations of the tones with the same MC origins, 'regular' changes are found. The tone systems of the five counties demonstrate a close correspondence and the features of being 'dynamic' and 'changing'. How to study these nonstatic, related tone systems in these geographically adjoining counties?

This book attempts to answer these questions. Different from the studies based on the one-county-one-spot fieldwork, this research collects sound materials at the town level, and at one investigation spot we record the sounds qualified for acoustic analyses from two or more speakers. At the place where nonmodal voices appear or the tonal varieties or variations are complex, the investigation is conducted at the village level. This research is mainly based on the statistical analyses. Under the Multi-Register Four-Level (RL) tonal model (Zhu, 2009, 2010, 2011, 2012a), this research defines the uni- and multi-phonational tone systems in the five counties on the Jianghan Plain and then reconstructs the process of tone evolution through the comparison of the synchronic features and distribution patterns of the tones.

For general readers, the book may shed light on their curiosity for 'What are tones?' by offering a comprehensive introduction to simple as well as complex tones. There are uni-phonational tone systems in the five counties on the Jianghan Plain. These tone systems are produced only by the modal voice like the case of Beijing Mandarin and include four to five tones. Moreover, there are multi-phonational tone systems produced by both modal and nonmodal (falsetto and breathy) voices, and

the tone number ranges from five to ten. In addition to the general curiosity, the book may also help the students and teachers of language education with its description and definition of tones. And for the study of tones, this book attempts to support the criterion of 'distinguishing different phonation types' in the definition of tones and to show the effect of the evolutionary perspective in the study of the 'changing' languages demonstrated by the synchronic differences among and within individual dialectal varieties and speakers.

Given the aim, the book attempts to answer the questions 'How to define the multi-phonational tone systems?' and 'How to study the nonstatic tones?' These concern the issues below.

(1) What is the relationship between phonations and tones?
(2) What are the components of tones?
(3) How to understand and interpret the 'dynamic', 'changing' tones demonstrated by their synchronic varieties and variations?

1.2 Tones: Identification, Definition, and Transcription

In 1911, Yuen Ren Chao 'coined' the term '声调' (Shēngdiào, 'tone'), to 'refer to the phoneme using different pitch heights to distinguish characters' (Chao, 1959: 59, 64). Before this definition, Chinese tone existed as an uncertain object.

About 1500 years ago, Shen Yue (441–513 A.D.) (沈约, Shěn Yuē; a Chinese philologist, historian, and politician) used '四声' (Sìshēng, 'the Four Tones') to denote the tones of Chinese phonological systems. To help writers rhyme their poems, Shen wrote *Sisheng Pu* (四声谱, Sìshēng Pǔ, Score of the Four Tones), and his friend Zhou Yong (周颙, Zhōu Yóng) wrote *Sisheng Qieyun* (四声切韵, *Sìshēng Qiēyùn*, a rhyme book) and invented Yongming Style (永明体, Yǒngmíng Tǐ, a poem style) that rhymes according to the Four Tones, Ping (平, Píng, Level, one member of the Four Tones), Shang (上, Shǎng, Rising, one member of the Four Tones), Qu (去, Qù, Departing, one member of the Four Tones), and Ru (入, Rù, Entering, one member of the Four Tones). The two rhyme books were both lost in the history, but the expression and the concept of the Four Tones were spread and used from then on. Though the word 'Sheng' (声, Shēng) or other similar expressions did appear in some earlier works, it is generally accepted that the concept of tone becomes definite and spreads only after Shen and Zhou's application (Liu, 1924: 86–91; Tang, 2002: 54–55; Wang, 1957–1958: 8).

After this non-segmental component was identified, for a long period of time, though the ancient rhyme books were compiled according to the Four Tones, only a few remarks concerned what the Four Tones were like. In *Yuanhe Yunpu* (元和韵谱, Yuánhé Yùnpǔ, Yuanhe Rhyme Score) by some monks of the Tang Dynasty, the Four Tones are described as '平声哀而安, 上声厉而举, 去声清而远, 入声直而促' ('Pingsheng is sad and placid; Shangsheng is sharp and rising; Qusheng is clear and distant; Rusheng is straight and checked'). In *Yuyaoshi Gejue* (玉钥匙歌诀, Yùyàoshi Gējué, Yuyaoshi Verse Formula), written by some monks of the Ming Dynasty, the Four Tones are recorded as '平声平道莫低昂, 上声高呼猛烈

强, 去声分明哀远道, 入声短促急收藏' ('Pingsheng is spoken level, neither low nor high; Shangsheng is shouted out, violent and intense; Qusheng is distinct and clear, a sad voice on a far road; Rusheng is short and checked, the sound retrieved promptly'). These words are 'very metaphysical' (Chao, 1959: 72) to answer the question 'What on earth are the tones?' Together with the varied contemporary states of the MC groups, these poetic descriptions leave us only the space to imagine what the tones sound like then. Although it is uncertain what the Four Tones are, the rhyme books after Shen Yue and Zhou Yong's contribution offer the evidence for the re-categorization and evolution of the MC tones. For example, in the fourteenth century, *Zhongyuan Yinyun* (中原音韵, *Zhōngyuán Yīnyùn*, *Central China Rhymes*) by Zhou Deqing (周德清, Zhōu Déqīng, a Chinese philologist of the Yuan Dynasty) pointed out that Level split into a Yin (阴, Yīn, a MC phonological category) tone and a Yang (阳, Yáng, a MC phonological category) tone, Zhuoshang (浊上, Zhuóshǎng, the MC Shang category with Zhuo/voiced initials) merged into Qu, and Ru fell into the three non-Ru tones.

Around the seventeenth century, the Western missionaries introduced the Roman alphabetic transcription to China and adopted a set of symbols to transcribe the Chinese syllables, e.g., as in the *Portuguese-Chinese Dictionary* (Ruggieri and Ricci 1583–1588, unpublished, cited from Tao, 2019) and *Wonder of Western Writing* (Ricci, 1605). Figure 1.1 is excerpted from *Wonder of Western Writing*. As shown in the figure, Ricci (1605) transcribes the Chinese initials and finals with alphabetic letters and uses five graphic marks , ¯ ˆ ` ´ ˇ, to designate respectively the five Chinese tones—Yinping, Yangping, Shangsheng, Qusheng, and Rusheng.

The tone marks are put over the finals in this transcription. As shown in Fig. 1.1, Yinping is represented by ¯ as in the cases for the Yinping characters like 之天坚; Yangping, as in the cases for the Yangping characters like 疑何乎然元, is marked by ˆ; Shangsheng by ` as in the case for the character 火; Qusheng by ´ as in the cases for the characters like 瞬浪懼命; and Rusheng by ˇ as in the cases for the characters like 則一莫石復.

A Help to Western Scholars (西儒耳目资, *Xīrú Ěrmùzī*; Trigault, 1626) follows Ricci's approach to transcribe the Chinese syllables. Trigault states in the book his

Fig. 1.1 Transcriptions of Chinese syllables in *Wonder of Western Writing*