

Theory and Methods in Sociophonetics Research: A Review of Sociophonetics

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Abstract: The book “Key Topics in Sociolinguistics” represents the latest contribution published by Cambridge University Press, which delves into the specialized field of sociophonetics with comprehensive detail. This academic piece systematically outlines the basic concepts, main theories, interdisciplinary approaches, and methodological practices prevalent within the domain of sociophonetics. The book is characterized by its rigorous structure and innovative content. It meticulously elucidates the research methods commonly employed in sociophonetics, exemplified through detailed analysis of vowels and sibilants, thereby providing readers with concrete instances of phonetic study. Furthermore, it discusses the social factors affecting phonetic variation, and the formation of regional and social dialects. It not only furnishes readers with a profound understanding of the current landscape of sociophonetic research but also offers significant guidance for future studies in this evolving field. This in-depth review aims to underscore the critical contributions of the work, positioning it as an indispensable tool for those engaged in the intricate exploration of sociophonetics.

Keywords: Sociophonetics; Speech Production; Speech Perception; Synchronic Variation

1. Introduction

Sociophonetics, co-authored by Associate Professor Kendall from the University of Oregon and Professor Fridland from the University of Nevada, Reno, was published by Cambridge University Press in 2021 [1]. The book is considered an academic masterpiece of the new era, thoroughly elucidating the basic concepts, core topics, and research methods in the field of sociophonetics, while also presenting numerous examples based on real

corpora. The combination of theory and practice is particularly beneficial for readers from diverse backgrounds and experiences to deeply analyze sociophonetics research. The following is a brief introduction and review of the content of the book.

2. Analysis on Sociophonetics

Sociophonetics is a burgeoning discipline within the field of linguistics. Rooted in early acoustic phonetics and variationist sociolinguistics, it employs empirical methods to conduct interdisciplinary research at the intersection of sociolinguistics, phonetics, and psycholinguistics. However, it is also closely associated with experimental phonetics, phonology, and the psycholinguistic aspects of language cognition and processing. Sociophonetics encompasses a range of perspectives on speech production, perception, and processing, with a focus on both the speaker and the listener. In short, sociophonetics represents an integrative development of sociolinguistics, phonetics, and psycholinguistics, with phonetics at its core. The book consists of five parts, divided into nine chapters.

2.1 What is Sociophonetics

The first part (Chapter One) primarily aims to clarify “What is Sociophonetics”. This chapter briefly reviews the basic characteristics of phonetics, phonology, and psycholinguistics, and discusses the differences between phonetics and sociophonetics, as well as between sociophonetics and variationist sociolinguistics, highlighting the significant contributions of sociophonetics in the areas of speech production and perception.

2.2 Analysis on Phonetic Features

The second part (Chapter Two and Three) focuses on two phonetic features: vowels and sibilants, reviewing the methods of data collection and analysis in sociophonetics, and

illustrating general rules through specific examples. Chapter Two introduces the development of research methods in sociophonetics, aiming to acquaint readers with the basic terminology, research steps, and methods widely involved in the field. In this chapter, the authors outline the methods and classifications of phonetic research, introduce articulatory phonetics and acoustic phonetics, and supplement them with examples of waveforms and spectrograms to elucidate vowels and consonants, wide-band and narrow-band spectrograms, explanations using sine wave examples for frequency, amplitude, and phase, as well as an analysis of formant structure. Additionally, the authors use vowels and sibilants as examples to outline the research background, basic terminology, types, and methods of acoustic measurements in sociophonetics, supplemented with case analyses.

In Chapter Three, the authors provide more specific examples to offer practical guidance, aiding readers in conducting fundamental acoustic analyses. Firstly, the authors provide a detailed introduction and analysis of the vowel measurement process, including how to identify and delimit tokens, adjusting settings, extract vowel formants, and visualize data. Regarding token selection, for unlabeled data, you likely need to listen through long stretches of the recordings, selecting tokens as you find them. For labeled data, you might automatically identify or search for potential tokens, using the transcription or annotation as a guide to the recording. Once labeled, formant measurement is conducted, with the linear predictive coding (LPC) algorithm being used in almost all vowel measurements, followed by data visualization and normalization. The authors emphasize the distinct differences in articulation and acoustic properties between vowels and consonants, thus focusing primarily on sibilants as an example to introduce consonant analysis methods. This includes identify and delimit tokens, acoustic measurement, data visualization, and normalization. While there isn't a universally recognized optimal measurement method for sibilants, researchers may conduct multiple measurement attempts as needed. Among various methods mentioned, center of gravity (COG) and spectral peak method are widely used. Though the chapter mainly concentrates

on vowels and sibilants, the primary methods and principles for conducting sociophonetics acoustic analysis can be demonstrated through these two features.

2.3 Analysis on Methodological Issues

The third part (Chapter Four to Seven) focuses on methodological issues, discussing regional dialectology, social identity and group affiliation, personal identity and linguistic style, and sound change. Chapter Four focuses on speech production and perception, paying attention to the two core elements of region and space. This chapter begins by elaborating in detail on the origins, development, and research content of dialectology, supplemented by the spread of the uvular R ([R]) sound as an example. It also explores regional variations in sociolinguistics and regional variations in sociophonetics. The above three sections emphasize the study of speech production, while the fourth section on perception and regional variation pertains to speech perception research. The author aims to clarify the differences in regional dialects through a series of perception studies. The fifth section's discussion on complex spaces demonstrates the significant impact of space on language variation and change, highlighting three types of human geographical spaces: geometric space, social space, and perceptual space. It is these social and perceptual spatial factors that influence the variation and change in language. Chapter Five systematically introduces the social factors that affect language users' speech production and perception, covering five macro elements: region, social class, gender, ethnicity, and age. In this section, the author primarily expounds on the basis of the "social" attribute in sociophonetics, namely: the four core elements of social class, gender, ethnicity, and age. Factor one, socioeconomic status (SES) (i.e., social class), results from the inequality present within social and individual speech communities. The author uses Labov's early classic New York City /r/ study as an example to explain how many studies on social class are conducted based on occupation and education to calculate SES. Meanwhile, Lesley and James Milroy introduced the network concept into sociolinguistics, providing a broader set of analytical tools and theoretical perspectives for understanding the processes of variation and change. Factor two, gender. The

author revisits Labov's New York City /r/ pronunciation and the Martha's Vineyard studies to explore the interaction between gender and class in language variation and change. Factor three, ethnicity. The significance of ethnicity in sociophonetics varies greatly across different societies and cultures. Ethnic dialects often have distinct phonetic characteristics that stem from the influence of underlying languages. Factor four, age, has always been a key factor in language research. This factor is important both cognitively and perceptually, whether in the developmental stage (young people) or in the stage of language decline/hearing impairment (elderly). Furthermore, the author indicates that the most valuable aspect of sociophonetics lies in analyzing how language variation changes along with social changes.

Chapter Six addresses the shortcomings of the previous two chapters, which only focused on the macro-level, by concentrating on intra-individual variation and the construction of language style. Initially, the chapter reviews research on individual variation within the fields of linguistics and phonetics. Then, the author explores individual variation within the sociolinguistics domain from the perspective of style, identifying three main sociolinguistic style models: the first model, the Attention to Speech model proposed by Labov; the second model, Bell's Audience Design model; and the third model, the Speaker Design model. Furthermore, the author elaborately discusses the three waves of variation in sociolinguistics development. In the study of language variation and change, there exist three types of research, each with distinct research purposes and methodologies, referred to as the "three waves" [2-3]. The first wave focuses on the association between language variation and change and macro-social factors (such as social class, gender, ethnicity, age) aiming to explore social stratification variations within and between communities (illustrated by Labov's New York City studies). The second wave reflects the ethnographic research approach, employing social network methods to investigate language variation (exemplified by Labov's Martha's Vineyard studies). The third wave concentrates on style research, emphasizing the observation of individual variation changes (illustrated by Bucholtz's study in a California high school). Finally, the

chapter discusses the sociophonetics research on sibilant sound variation, extending the focus from the macro-social factors in chapter five to individual social significance.

Chapter Seven begins by reviewing the main theories of sound change and then focuses on the contributions of sociophonetics to the understanding of sound change. The chapter opens with a discussion on synchronic and diachronic studies, then moves on to explore theories of sound change, elucidating only the first two stages: the influential Neogrammarian theory of sound change at the end of the 19th and beginning of the 20th century, which was primarily based on comparative linguistics methods, with Jakob Grimm proposing the famous "Grimm's Law"; unlike the Neogrammarians, the Lexical Diffusion theory posits that sound change is dominated by words. Subsequently, the author provides a detailed overview of the Labov research projects, including the master's thesis project on Martha's Vineyard and the doctoral thesis project on New York department stores. The New York City study is considered the beginning of modern sociolinguistics. The author concludes that Labov's contribution to the theory of sound change is immeasurable. Finally, the chapter discusses the contributions of sociophonetics to sound change and the future of sound change theories.

2.4 Sociophonetics and its Methodological Future

The fourth part (Chapter Eight) is titled "Sociophonetics and its Methodological Future," summarizing the latest developments in data extraction and coding. The author starts by reviewing the balance between traditional and new methods, pointing out that many computational methods involved in phonetic analysis or natural language processing have completely moved away from focusing on formant frequencies. Instead, more studies now utilize measurements based on Mel-frequency cepstral coefficients rather than those based on LPC formant values in vowel sociophonetics. Secondly, the author mentions the development of open-source software programs, such as Praat, which have propelled the evolution of sociophonetics measurements from manual to automatic. In this chapter, the author sequentially discusses the new computational tools that future sociophonetics

might involve, including corpus-based phonetics and computational sociolinguistics; the current state-of-the-art technologies (such as forced alignment and automatic formant extraction); as well as future development trends and their pros and cons. Finally, the chapter outlines the development of artificial intelligence, machine learning, and their applications.

2.5 Sociophonetics Summary

In the conclusion of part five (Chapter Nine), the author briefly summarizes the contributions of sociophonetics to linguistic theory and speech technology, elucidating the relationship between sociophonetics and linguistics, and highlighting the interdisciplinary prospects of the field. At the same time, the chapter also analyzes the future outlook of sociophonetics, such as: continuously evolving opportunities from speech computer processing technologies; benefiting other related fields (such as forensic phonetics and speech pathology) with the advances in sociophonetics; and enhancing human-computer interaction.

3. Brief Review

The term “sociophonetics” was first encountered in the doctoral dissertation by Deschaies-Lafontaine on the study of Quebec French in Canada [4]. It was not until the 1990s that it gradually became a relatively independent field of study [5], and some research on Chinese has also begun to employ the sociophonetic research framework [6]. Research related to sociophonetics is predominantly found in studies of English and other European languages, making investigations into non-English and non-European languages particularly significant. In recent years, there has been a gradual increase in studies concerning Chinese dialects [7-9]. The research in sociophonetics integrates phonetics, sociolinguistics, speech science, and psycholinguistics. It primarily focuses on how speech is produced, perceived, and understood within specific social and cultural contexts, covering disciplines such as sociology, psychology, linguistics, and anthropology, thus exhibiting distinct interdisciplinary characteristics. This book systematically consolidates the theoretical background, cutting-edge research, and fieldwork of sociophonetics, providing a comprehensive

resource that combines theory and empirical research for scholars new to the field. The main highlights of the book include:

First, the book is well-structured and practical. It starts from the basics of sociophonetics, explores specific methods and steps in speech research using vowels and sibilants as examples, and then delves deeper into the relationship between sociophonetics and social factors, individual variation, and sound change. Each chapter includes a preview, summary, key terms, and literature recommendations. Particularly, some sections include experimental methods and practical exercises, fully meeting the practical needs of scholars.

Second, the content of the book is rich, with theory and examples complementing each other. Not only does it delve into various details of sociophonetics, such as the foundations, theories, measurement methods, intra-individual phonetic variation, and the social attributes of speech style, but it also incorporates specific research cases. The content covers both production and perception studies; it includes traditional research methods as well as interdisciplinary studies utilizing new theories and methods.

Third, the unique perspective of the book showcases the forefront of the discipline. This book not only employs traditional research methods but also introduces the latest achievements and trends in future sociophonetics research in chapter eight. Particularly in terms of experimental methods, the book emphasizes the critical role of social and cultural backgrounds in phonetic research, providing new methodologies for the development of sociophonetics and promoting its deeper investigation.

The book *Sociophonetics*, undoubtedly makes an outstanding contribution to the field of sociophonetics, yet there are areas that could be improved. Firstly, the book, whether in terms of sociophonetics phenomena or case studies, focuses predominantly on English, particularly American English, and lacks research on non-English languages and backgrounds. Future studies could adopt more comprehensive and inclusive research methods instead of being confined to a single language perspective. Secondly, due to space limitations, there is less focus on practical methods in the book, and it does not cover statistical and quantitative analysis, which may disappoint

readers seeking to apply statistical techniques in sociophonetic research. Additionally, in terms of the scope of research, the majority of the cases and corpora focus predominantly on large cities or metropolitan areas, leaving the phonetic characteristics of rural or other marginalized communities underrepresented and not sufficiently addressed. Future research could broaden its scope to encompass these underexplored areas, offering valuable insights into the diversity of language use and phonetic variation across different social and geographical environments. Lastly, from a theoretical framework perspective, although it covers the basic principles of sociophonetics, the “three waves” of variationist sociolinguistics, individual variation, and style theories in detail, some emerging and critical theories are not fully explained. For example, the fourth wave of variationist sociolinguistics focusing on the brain and cognition is a logical progression of Eckert’s three-wave model [10].

4. Summary

In summary, sociophonetics, although still in a developmental stage, has shown tremendous research potential and broad application prospects. This book, with its rigorous structure, comprehensive research content, rich case studies, and innovative perspectives, presents the main contents and latest advancements in the field to readers. Undeniably, this book will inspire more scholars interested in sociophonetics to deepen their understanding of the field, thereby promoting its further development. Despite some shortcomings, it is undoubtedly an important book in the current study of sociophonetics and is highly recommended to researchers and scholars in related fields.

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