Tonal bilingualsim: the case of two related Chinese dialects
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English Summary

This thesis investigates the lexical processing system in a special type of bilingualism, which involves (1) two tonal systems, (2) two closely related dialects, and (3) a common logographic writing system.

Although the role of lexical tones in lexical access is receiving more and more attention, how two tonal systems interact in the bilingual mental lexicon is largely unknown. Additionally, the fact that systematic correspondence exists between two vocabularies of closely related dialects has long been known by historical linguists. However, the systematic correspondence has rarely been associated with the rich lexical variants in bilingual lexical production. Neither has it been associated with the bilingual individuals' sociolinguistic and cognitive backgrounds. Moreover, most previous studies of bilinguals' visual word recognition assumed that the bilinguals either use similar alphabetic writing systems or different types of writing systems for their two languages. However, the possibility that the same logographic writing system can be used in the bilingualism of two closely related dialects was largely neglected. In this case, in spite of the phonological difference between the etymologically related translation equivalents, exactly the same visual word form can be used. How such common visual word forms activate phonological information in the bilinguals' mental lexicon also needs more investigation.

Standard Chinese (SC) and Jinan Mandarin (JM) are both Mandarin dialects. SC is the official standard language used by China, with the phonology based on the Beijing dialect. JM is the Mandarin dialect spoken in Jinan, 497 km to the east of Beijing. Using the bilingualism of SC and JM as the test case, a series of theoretical and empirical issues are examined in this study, with a focus on the role of tonal information in lexical access. To answer the corresponding research questions, both speech production and lexical comprehension data were collected in the field, using behavioral experiments. Since this thesis is based on a collection of articles the detailed research backgrounds, discussions, and conclusions can be found within each chapter. In the following parts of this summary, a brief description is given for each chapter.

Chapter 1 is the general introduction. After a brief introduction of the basic research questions, each of the related research fields is reviewed. The overview is organized around the three unique aspects of this bilingualism. First, this bilingualism involves two tonal systems. A summary is given on the uniqueness of tonal languages in speech perception and lexical access. Then the perceptual learning of non-native lexical tones, interlingual tonal perception, and other bilingual studies involving Chinese are overviewed. Second, this bilingualism involves two closely related dialects. Different from remote languages, closely related dialects show both similarity between the phonological inventories, and systematic correspondence between the vocabularies. For instance, the tonal categories of monosyllabic JM words are, to a large extent, predictable from the tonal categories of their SC translation equivalents. Since systematic correspondence has received little attention in the research of bilingualism, this session only provides a brief introduction to the mechanism and the corresponding phenomenon in the bilingualism under study. Third, this bilingualism involves a common

logographic writing system. The literature on interlingual activation in bilingual reading is reviewed and the situation in the bilingualism under study is explained with examples. After these general overviews, a separate theoretical introduction is given to each individual main chapter.

Chapter 2 investigates a case of two-to-one tonal mapping between the two tonal systems. This chapter focuses on the extent to which the interlingual category-goodness between different tonal systems keeps its impact on lexical access and speech comprehension. The two-to-one asymmetrical mapping of the JM rising tone and the SC high- and low-rising tones is verified in the distributions of acoustic properties and in interlingual perception. A semantic priming experiment shows that interlingual category-goodness only affects lexical access but does not affect the semantic activation after lexical retrieval, suggesting some discreteness between these two steps.

Chapter 3 statistically explores the effects of systematic tonal correspondence between SC and JM vocabularies in speech production. This chapter focuses on how the strength of systematic correspondence is influenced by the sociolinguistic and cognitive backgrounds of the individuals. Between-word pitch distances of JM words can be predicted from SC tonal categories using statistical modeling, with interlingual tonal identity and individual backgrounds taken into consideration. The global influence of the bilinguals' sociolinguistic and cognitive backgrounds on the strength of systematic correspondence is found for the first time. Different from the other chapters, this chapter shows a more inter-disciplinary approach. The findings in this chapter are discussed in light of the theories of language change and bilingual cognitive aging. Their implications for speech engineering are also discussed.

Chapter 4 further investigates the effect of tonal similarity on etymologically related translation equivalents in auditory lexical access. The tonal similarity has discontinuous (facilitative or interfering) effects on the lexical access of SC-JM etymologically related translation equivalents. The tonal similarity also interacts with language mode (i.e. SC versus JM) and test blocks in a complex way. However, the persistence of the language dominance effect [i.e. With SC as the dominant dialect, the SC word is processed faster than its JM equivalent] indicates that the lexical representations of translation equivalents in the bilingual lexicon are not only distinguished by lexical tones but also by language mode. Moreover, the SC-JM bilinguals have an unusual lexical advantage compared with the tonal-monolingual controls, suggesting that bilinguals of closely related dialects, with their mental lexicon full of etymologically related translation equivalents, may benefit in their auditory lexical access.

JM also shows a considerable number of tonal lexical variants in speech production, which is investigated in Chapters 5 and 6. These two chapters try to answer how tonal lexical variants are stored and accessed in the bilingual lexicon.

Chapter 5 studies the role of different types of tonal variability in JM auditory lexical access, with a focus on the processing of tonal pattern variation between tonal lexical variants. True repetition, within-category variation, tonal pattern variation, and lexically contrastive variation are compared in an auditory form-priming experiment. The results support the view that tonal patterns have representative status in lexical access but also converge in a lexically specific way.

Chapter 6 compares JM lexical variants which are either identical or non-identical to their SC translation equivalents in lexical access for speech production. The variant probability effect suggests that the SC-JM bilinguals do store the JM tonal lexical variant they did not produce in the corpus, and that the difference in individual one-time choice still mainly reflects the variant probability instead of the individual difference in lexical representation.

Chapter 7 investigates the automatic bilingual phonological activation from the common written forms, with a focus on how the SC-JM tonal bilinguals differ from SC tonal monolinguals in retrieving tonal information from Chinese characters automatically. Although showing a general lexical disadvantage in visual word production, the bilinguals benefit more from the congruent conditions and suffer less from the incongruent conditions in this Stroop experiment. The SC-JM bilinguals are also different from the SC tonal monolinguals in their lack of tonal sensitivity, which may be related to the bilinguals' attention control and advantageous for the Stroop task.

At the end, Chapter 8 summarizes and discusses the main-findings of this thesis. The main-findings are restructured around the main theoretical issues. The role of systematic correspondence in language change and the impact of cognitive aging on tonal bilinguals' lexicon are discussed on the basis of the results from Chapter 3. The results from Chapters 2 and 4 are assessed together in the discussion of interlingual tonal similarity in bilingual lexical access. Similarly, Chapters 5 and 6 both investigate tonal lexical variants with tonal pattern variation. The results from these two chapters are discussed together, with a focus on the lexical storage of tonal lexical variants. Chapter 7 provides further insight into bilinguals' lexical access, but takes the automatic phonological processing in visual word recognition into consideration. And finally, bilinguals' attention and executive control, as well as their influences in bilinguals' lexical access, are discussed on the basis of the results of Chapters4 and 7.