

PROSODIC BOUNDARIES EFFECT ON
SEGMENT ARTICULATION IN STANDARD CHINESE:
AN ARTICULATORY AND ACOUSTIC STUDY

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ABSTRACT

This paper presents an electropalatographic (EPG) and acoustic study of prosodic boundaries effect on the domain-initial segments in Standard Chinese.¹ Two speech sounds, namely, the voiceless unaspirated alveolar stop /t/ and the high front vowel /i/, were studied to examine the domain-initial strengthening in both spatial and temporal dimensions. The articulatory and acoustic parameters of the speech sounds were compared in initial positions of five prosodic constituents in Standard Chinese, namely, a Syllable, a Foot, an Immediate Phrase, an Intonational Phrase, and an Utterance. The results show that: (1) the production of the domain-initial consonantal gesture was prosodically encoded. The linguopalatal contact and the seal duration varied as a function of the prosodic boundary strength. The linguopalatal contact was dependent on the seal duration in a nonlinear fashion. Of the acoustic properties of the domain-initial stop, the total voiceless interval and voicing during closure were found to be reliable acoustic correlates that mark the hierarchical structure of the prosody. (2) At the release moment of the domain-initial stop, no consistent pattern was found to support the domain-initial strengthening. The linguopalatal contact of the vowel immediately following the domain-initial consonant did not show a clear trend of domain-initial strengthening; however, the phonatory features of vowels were indicative of pitch reset at major prosodic boundaries. These

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indicate that the domain-initial strengthening is restricted on the segment immediately following the boundary. In conclusion Standard Chinese strengthens the phonetic features of the domain-initial segments as a function of boundary strength, which serves as an important way to mark prosodic structure in Standard Chinese.

SUBJECT KEYWORDS

Prosodic boundaries Segment articulation Electropalatography
Standard Chinese

韻律邊界對漢語普通話音段發音的影響—
基於發音生理和聲學的研究

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提要

本文使用動態電子齶位元(EPG)和聲學分析的方法,考察漢語普通話韻律邊界對韻律單元域首音段的發音生理和聲學特徵的影響。我們選取普通話的清不送氣齒齶塞音/t/和前高母音/i/,從音段產生的空間域和時間域分析域首發音增強現象。普通話的韻律層級包括音節、音步、小韻律短語、大韻律短語和話語。通過比較不同韻律層次域首音段的發音生理和聲學參數,我們發現:(1)單元域首輔音的發音動作受到普通話韻律結構的制約。輔音的舌齶接觸和生理持阻時長與韻律邊界的強度密切相關;輔音的舌齶接觸與生理持阻時長之間呈現出非線性關係;輔音聲學時段的清聲段時長和濁聲時長比能夠有效地標記韻律邊界的強度。(2)輔音除阻時刻的舌齶接觸以及輔音後接母音的最大舌齶接觸受邊界強度的影響較小,且後接母音的嗓音特徵與較大韻律邊界的基頻重設有關。這說明域首發音增強的作用域限於韻律邊界後面的音段。研究結果表明,普通話韻律單元域首音段的發音特徵得到增強,且增強程度與邊界強度密切相關,這是標示普通話韻律結構的一個重要方式。

主題詞

韻律邊界 音段發音 動態電子齶位元 漢語普通話

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