

VAT OF THE LEXICAL TONES IN MANDARIN CHINESE

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ABSTRACT

The purpose of this research was to investigate the association of vocal attack time (VAT) and tones in speakers of Mandarin Chinese, and to explore how tones initiated at different pitch levels affected VAT. SP and EGG signals were synchronously recorded from 72 young undergraduates or postgraduates (42 females and 30 males) while they were reading aloud a wordlist of 50 disyllabic words at their most comfortable pitch, loudness and rate. VAT measures revealed three findings. (1) Vocal attack time shows no significant difference between the common *yangping* and the *yangping* derived from *shangsheng*. This, from a physiological perspective, supports the argument that the tone sequence 3-3 in Mandarin is indeed converted into 2-3, nothing else. (2) The tones of Mandarin Chinese that start from low pitch levels (35, 21) tend to present significantly different VAT values from those that start from high pitch levels (55, 51), with mean VATs of the former being much longer than those of the latter. This embodies the nonlinear contra-variant relationship between VAT and F0 at vowel onsets. (3) There are deviations or individual differences: a small number of people do not follow this pattern.

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普通话四声的声门碰撞时间研究

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提要

汉语作为典型的声调语言，有着四个能区分意义的词调：阴平(55)，阳平(35)，上声(214)和去声(51)。但由于连读变调，在语流中经常出现的四声调值为：阴平(55)，阳平(35)，上声(21)和去声(51)。本文旨在研究汉语普通话者的声门碰撞时间(Vocal Attack Time, or, VAT)与声调的关系，以探索起始于不同音高层级的声调对该参数的影响情况。我们从72位发音人(男30人和女42人)同时录制了50个双音节词的语音和喉头仪信号，所有发音人均为20多岁的在校大学生或研究生。单独样本的T检验表明：阳平以及由上声变来的阳平，去声以及由阴平变来的去声在声门碰撞时间上不存在显著性差异。这就从生理上支持了前两上声相连，前上变阳平的观点。二因素重复测量的方差分析表明：起始于低音高层级的声调与起始于高音高层级的声调在声门碰撞时间上存在着显著性差异，前者的值明显大于后者。但还存在有个体差异，72位发音人中有26位不符合这一模式。

关键词

声门碰撞时间 字调 发声起始 非线性反变关系