

Prosodic cues guide Mandarin-speaking preschoolers' identification of compounds but not lists

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1. Introduction

Compounds (N1+N2, e.g., *jellybeans*...) and lists (N1, N2, e.g., *jelly, beans*...) are distinguished by prosodic cues to word boundaries [1]. Studies found that preschoolers speaking English or Mandarin can produce distinct prosodic cues for compounds and lists by age 4 to 5 [1, 2]. However, English-speaking 5-year-olds show delays in *comprehension*, with above-chance accuracy in identifying compounds but not lists [2]. This raises questions regarding whether Mandarin-speaking preschoolers might also show similar delays in comprehending compounds vs. lists. Given that Mandarin-speaking preschoolers need to acquire pitch for lexical tones that are critical for word meanings, the acquisition of prosodic cues above the word level might be even more delayed than their English-speaking peers. The current study investigates the following two questions: (a) whether Mandarin-speaking 5 to 6-year-olds can use prosodic cues to identify compounds and lists, and (b) whether their performance develops with age, becoming more adult-like with time.

2. Methodology

A total of 63 Mandarin-speaking preschoolers participated in this study, including 34 5-year-olds (M = 5;4, SD = 3 months) and 29 6-year-olds (M = 6;1, SD = 2 months), with 43 adults recruited as controls.

Twelve picturable and familiar items were selected to form compounds (e.g., *xiong-mao* 'panda') and lists (e.g., *xiong, mao*, 'bear, cat'). The auditory stimuli were produced by a native female speaker using the carrier sentence *Zhao-dao X* 'Find the X' in a child-friendly register. The acoustic analysis showed that boundary cues were correctly implemented. A two-alternative forced choice task was performed. Participants were required to choose the target based on the auditory stimuli. The percentage correct (accuracy) were calculated. A one-sample t-test was performed to compare accuracy to chance (50%), exploring question (a). A linear mixed-effect (LME) model was fitted, with Condition (Compounds vs. Lists) and Age group (5-, 6-year-olds, and Adults) as fixed effects and Subject as random effects, addressing question (b).

3. Results

The results of the first analysis (Figure 1) showed that both child groups identified compounds significantly above chance (5-year-olds: $t(33) = 13.20, p < .001$; 6-year-olds: $t(28) = 9.38, p < .001$), but not in lists (5-year-olds: $t(33) = 1.09, p = 0.142$;

6-year-olds: $t(28) = 0.96, p = 0.173$). The results (Table 1) of LME revealed significant main effects of Condition and Group, and a significant Condition \times Group interaction. Post hoc comparisons using the Tukey HSD test indicated that no group difference in compounds was found (5-year-olds: M = 90.7, SD = 18.0; 6-year-olds: 87.9, SD = 21.8; Adults: M = 100, SD = 0), but both child groups had lower accuracy in lists compared to adults (5-year-olds: M = 55.9, SD = 31.5; 6-year-olds: M = 56.3, SD = 35.5; Adults: M = 100, SD = 0).

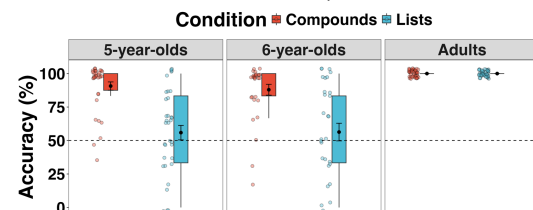


Figure 1. Accuracy of compounds and lists by age groups

Table 1. Statistical results from LME model.

Fixed effect	df1	df2	F-value	p-value
Condition	1	206	56.74	< .001
Group	2	206	42.59	< .001
Condition \times Group	2	206	16.01	< .001

4. Discussion

Our findings suggest that Mandarin-speaking preschoolers can use prosodic cues to identify compounds, exhibiting adult-like proficiency. However, they cannot use prosodic cues to identify lists. Our results extend previous findings from English [3], suggesting that phrase-level prosodic cues are also acquired and mastered late for preschoolers speaking tonal languages like Mandarin. Future research should investigate the relative weighting of different cues in boundary comprehension.

5. References

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