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Data Article

Brain MRI data in Chinese dyslexic children performing an auditory rhyming judgment task



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ABSTRACT

This article includes the description of data information from an auditory rhyming judgment task in Chinese children with developmental dyslexia, age-matched control children and reading-matched control children. You will find fMRI data information including experimental design, MRI protocol, and brain activation results from each of the three groups of subjects. Other results from the same study were published in Neuroimage (Cao, in press [1]).

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Specifications Table

| | |
|----------------------------|--|
| Subject area | <i>Psychology</i> |
| More specific subject area | <i>fMRI of reading disability</i> |
| Type of data | <i>Table</i> |
| How data was acquired | <i>fMRI</i> |
| Data format | <i>Analyzed</i> |
| Experimental factors | <i>Children with developmental dyslexia, age-matched controls, reading-matched controls</i> |
| Experimental features | <i>Auditory word pairs were sequentially presented, and subjects were told to press a button if they rhyme and another button if they do not rhyme</i> |

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Data source *East Lansing, Michigan, USA*
 location
 Data accessibility *Data are within this article*

Values of the data

- Current data can be used to examine the phonological processing in Chinese-speaking children.
 - Current data can be used to compare to phonological processing in other languages.
 - Current data can be used to compare to phonological processing in Chinese-speaking adults.
 - Current data can be used to examine phonological processing in children with reading disability
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1. Data

The fMRI data are from an auditory word rhyming judgment task in native Chinese speaking children with or without developmental dyslexia. Children with developmental dyslexia and age-matched control children were 5th-graders in elementary school with an age range of 10–12 years old. The reading matched control children were 3rd-graders in elementary school with an age range of 8–10 years old. The fMRI data were the result of brain activation in each of the three groups of subjects. Other results from this study were published in Neuroimage [1].

2. Experimental design, materials and methods

2.1. Cognitive tasks

2.1.1. Auditory rhyming judgment

Two words were presented sequentially in the auditory modality and participants were asked to determine whether the second syllable of the words rhymed. All words consisted of two characters. In order to eliminate the possibility of making decisions based solely on phonological or tone information, we controlled for the similarity of the orthography, phonology, and tone of the second character in the first and the second word. There were 24 trials in each of 4 conditions, similar orthography and rhyming (O+P+, e.g. 弥补/bu3/, 纯朴/pu3/), similar orthography and non-rhyming (O+P-, e.g. 翻译/yi4/, 选择/ze2/), different orthography and rhyming (O-P+, e.g. 环保/bao3/, 大炮/pao4/), different orthography and non-rhyming (O-P-, e.g. 损坏/huai4/, 学科/ke1/). In half trials of each condition, the second character of the first and the second word had the same tone (e.g. 弥补/bu3/, 纯朴/pu3/), and in the other half they had different tones (e.g. 逮捕/bu3/, 胸脯/pu2/).

2.1.2. Stimulus characteristics

All words used in this experiment did not have homophones. The two character words were matched on several variables across tasks, conditions, and presentation orders using analysis of variance (ANOVA) models of 2 task (rhyming and spelling) \times 4 condition (O+P+, O+P-, O-P+ and O-P-) \times 2 presentation order (first word and second word). These variables were adult written frequency (Beijing Language and Culture University, [2]), number of strokes, word familiarity in third-graders, and word familiarity in fifth-graders. Word familiarity was assessed in an independent study on 50 third-graders and 50 fifth-graders through a 7-point scale.

The second characters of words were also matched on several variables across tasks, conditions, and presentation orders using ANOVA models of 4 condition (O+P+, O+P-, O-P+ and O-P-) \times 2 presentation order (first word and second word). The variables were adult written frequency (Beijing Language and Culture University, [2]), and number of strokes.

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