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Central Coherence in relation to Reading in Hong Kong Bilingual Children with Autism Spectrum Disorder

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Background

When interacting with text, children with autism spectrum disorder (ASD) show different comprehension profiles including imaginative, strategic, and text bound. Previous research mainly examines monolingual ASD children, with more focus on alphabetic reading (English) than logographic reading (Chinese).

Objectives

➢ To examine if Chinese-English bilingual ASD children use different strategies in processing Chinese and English texts.

➢ To explore if ASD bilinguals have difficulty in processing lexically ambiguous words (homographs) and if contextual information helps ASD bilinguals to derive context-dependent meaning.

Methods

Subjects

➢ Two subject populations participated in the study, a group of 10 Hong Kong ASD bilinguals with mean age: 9;09 and a group of 22 Hong Kong bilinguals with typical language development (TD) with mean age: 9;02.

➢ All participants were studying at local primary schools and had intelligence within normative range.

Tasks and Procedures

❖ Homophone Task

20 sentences written in Chinese and 20 in English were given. All the sentences contained 1 homophone. E.g.今天考試的試題十分容二 。 *(The questions in the exam are very easy.)* "二" /ji6/ means *number two, in fact* , "易"/ji6/ should be used , meaning *easy.* The participants had to judge if the sentences were correctly written and underline the wrong use of homophones.

Results

Homograph Task

➢ The ASD group performed (mean=30.36, SD=7.02) less well than TD children (mean=33.52,SD=2.82) in reading aloud the homographs presented in two-character-word contexts. [t(30) = 1.40, p = 0.18].

➢ ASD children made more errors when the homographs were presented in a less typically used context. They tended to give the more typically used pronunciation irrespective of the context provided (see Table 1).

Table 1. Examples of trials where ASD group made incorrect pronunciation.

Homograph in two word characters	Context-appropriate pronunciation	The common mispronunciation of ASD participants
姓區	/sing3 au1/	/sing3 keoi1/
可惡	/ ho2 wu3/	/ho2 ok3/
附和	/fu6 wo6/	/fu6 wo4/
將士	/zoeng3 si6/	/zoeng1 si6/
車馬費	/geoi1 maa5 fai3/	/ce1 maa5 fai3/
朝早	/ziu1 zou2/	/ciu4 zou2/

Word Memory Task

➢ Performance of the ASD group (mean = 3.10, SD = 1.49) was significantly poorer than the TD group (mean = 4.36, SD = 1.19) in recalling semantically unrelated English nouns [t(30) = 2.58, p < 0.05]. The two groups was marginally significantly different in recalling semantically related English nouns (mean = 5.07 SD = 1.21 for the TD group, and mean = 4.15 SD = 1.70 for the ASD group) [t(30) = 1.75, p = 0.09].

➢ Performance of the ASD group (mean = 4.10, SD = 1.58) was significantly poorer than the TD group (mean = 5.20, SD = 1.22) in recalling semantically related Chinese nouns [t(30) = 2.16, p < 0.05]. The two groups did not differ significantly in recalling semantically unrelated Chinese nouns (mean = 4.45 SD = 1.44 for the TD group, and mean = 3.85 SD = 1.67 for the ASD group) [t(30) = 1.05, p = 0.30].

Homophone Task

➢ No significant between-group differences were found in either language.
➢ For Chinese: Mean score = 17.5, SD = 3.17 for the TD group. Mean score = 17.8, SD = 2.74 for the ASD group.
➢ For English: Mean score = 15.59, SD = 3.46 for the TD group. Mean score = 16.00, SD = 4.71 for the ASD group.

Lexical Ambiguity Task

➢ No significant between-group differences were found.
➢ Mean score = 19.64, SD = 0.90 for the TD group. Mean score = 19.80, SD = 0.63 for the ASD group. Both groups performed near ceiling for this task.

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Methods (Cont)

❖ Homograph Task

The participants were given a list of 40 homographs to read. For example "單" can be pronounced as /daan1/ (meaning *single*) or /sin6/ (which is a surname in Chinese). Each homograph was presented in two two-character-word contexts (e.g., the homograph "單"was presented in "單獨" /daan1 duk6/, meaning *alone*, and "姓單" / seng3 sin6/, meaning *surname is /sin6/).* They were asked to read aloud the words.

❖ Word Memory Task

Two lists of Chinese words, one containing 12 semantically related concrete nouns and another 12 semantically unrelated concrete nouns, were presented verbally to participants. They were asked to free recall each list. The same procedure was repeated with two lists of English words.

❖ Lexical Ambiguity Task

Participants had to choose a correct item from the given fillers which fit the context. The given fillers in each question contained a homophone, a lexically related and meaning-matched item, a lexically related but non-meaning-matched item and a non-meaning/ non-sound/ non-visually-matched item.

Conclusion

➢ The ASD group showed weakness in processing homographs. Their weakness is not alleviated even if context cues are provided.

➢ The ASD group performed poorer than the TD group in word memory. They performed less well than the TD group in recalling Chinese unrelated word lists and English unrelated word lists. The finding may suggest that they use different strategies in processing Chinese and English words.