Abstract

Objectives: Reading disability (RD) is widely viewed as a key obstacle in the development of literacy. Studies show that between 15-20% of grade-school students have RDs, and as a result many drop out of school in their early age (i.e., by high-school). According to national statistics, fifty percent of the inmates in jail cannot read. One might reasonably conclude that RD can be a ticket to jail for a significant percentage of RD children.

Design: We shall show that the source of RD in young children (8-12 yrs) is related to inadequate phonetic non-categorical processing skills, rooted in pre-school language development. This conclusion is based on a Syllable Confusion Oddball task (SCO) on children with documented reading disabilities. The SCO task tested normal-hearing RD children, having normal language function, in their ability to identify different syllable (CV, VC) from a string of three such syllables, spoken by three different talkers, from a data base of 20 adult talkers.

Results: The experimental results showed that the 10 RD children had 5 times the error compared to the reading control (RC) group.

Conclusion
1) RD children have a significant speech perception problem in identifying nonsense syllables, despite normal pure-tone hearing and language processing ability.
2) Our conclusions are at odds with previous publications which found no sign of phone impairment.

Methods
- 10 one-hour sessions weekly
- Approximately 10-min. blocks, with 5 min. of playtime between each block
- 24 consonants and 15 vowels
- Almost 15,000 trials per subject (average)
- Participants: Reading Control Group (RCs) and Reading Disabled Group (RDs)

SCO Task
A random sequence of 3 nonsense CV(Consonant-Vowel) or VC (Vowel-Consonant) syllables Spoken by 3 different talkers From a set of 18 professionally recorded talkers e.g.: [da] (Voice 1) - [oa] (Voice 2) - [ta] (Voice 3) [ga] (Voice 1) - [bo] (Voice 2) - [go] (Voice 3) [et] (Voice 1) - [it] (Voice 2) - [t] (Voice 3)

A Review of RD studies

- Brandt concluded that there was no significant impairment in phonetic perception in children with RD(1980).[1]
- Rosen pointed out some association, but no causal relation of auditory deficits (temporal processing or other) to specific RD (2003).[2]
- Rosen pointed out there is no correlation between auditory and speech perception deficits (2011).[3]
- Ziegler reported speech perception deficits in RD in noise but not in quiet(2009).[4]

In summary, there was a weak or no relation between speech perception and reading ability.

Conclusions
- RD children have a significantly larger phone error relative to the reading control (RC) children.
- Each RD subject has unique phone errors.
- RC subjects are similar in performance
- Our experiment result revealed a striking separation of the RC and RD children when discriminating both consonant and vowels in the syllable-initial or syllable final position.

References