

Critical Review of the Literature: Does phonological awareness predict oral reading in individuals with Down syndrome?

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Abstract: This critical review examined whether phonological awareness predicts oral reading in individuals with Down syndrome in six studies. Study designs included: one single-group pre-post test research study, two single-group post-test only research studies, and three case-control research studies. Overall, the evidence suggests that phonological awareness does not predict oral reading in individuals with Down syndrome. The results were not strong enough to suggest clinicians to use phonological awareness skills to teach oral reading to individuals with Down syndrome. Further research is needed in this area.

Introduction

from the same skills. Literacy skills (e.g., reading) are

Down syndrome (DS) is a chromosomal disorder caused by an extra 21 chromosome. Individuals with DS possess unique developmental characteristics in the areas of speech and language, memory, and cognition. Their visual skills are better than their verbal skills and their receptive vocabulary is better than their expressive language and grammar skills (Snowling, Nash, & Henderson, 2008). Reading single words aloud is another area of relative strength for children with DS (Bryne, MacDonald, & Buckley, 2002). Although, individuals with DS show strengths in reading, they are not universal due to individual variations in sub-domains of reading skills (Roch & Jarrold, 2008).

The contribution of phonological awareness (PA) has received a lot of attention as a predictor of reading acquisition in typically developing (TD) children (Boudreau, 2002). Phonological awareness requires attending to, thinking about, and manipulating individual phonemes within syllables and spoken words (Scarborough & Brady, 2002). Phonological awareness covers a range of concepts including: rhyming, segmentation, blending, manipulation, categorization, and identification (Scarborough & Brady). Research has demonstrated PA strongly predicts oral reading abilities in TD children. Studies have found reciprocal or bidirectional relationships between PA and reading in TD preschool and kindergarten children (Burgess & Lonigan, 1998; Wagner, Torgesen, & Rashotte, 1994). Lonigan, Burgess, Anthony, and Barker (1998) found that PA skills at different complexities predict word reading abilities in TD children. In adults, word reading is also significantly related to PA, drawing parallels between children and adult literacy acquisition (Durgunolu & Öney, 2002).

If PA is a predictor of reading abilities in TD children, than individuals with DS should be able to benefit

Results

The studies are organized by levels of experimental evidence, from high to low.

Gombert (2002) conducted a non-randomized, case-

with no implications or rationales provided by Gombert (2002). Furthermore, the author included the mean WISC IQ scores of both groups, however, failed to consider and perform any statistical analyses on any differences in IQ among the groups. Lastly, the study by Cupples and Iacono (2000) was a longitudinal study. Therefore, gains developed by the children with DS could have been due to developmental changes or educational benefits.

Taken together, the studies provided either level 2B or level 3 experimental evidence. These were considered either one or two levels below the ideal or 'gold-standard' experimental design. Due to methodological restrictions, such as sample size and demographics, it is impossible to increase experimental evidence to level 1.

Discussion

This section of the critical review will discuss patterns found among all studies presented up above. Despite the limitations discussed in the previous section, some important trends emerged.

First, predictive results were not found between PA and oral reading skills in individuals with DS. Only one study, by Cupples & Iacono (2000), found some evidence for a predictive relationship between phoneme segmentation skills and nonword reading in children with DS because multiple regressions were analyzed. A study by Gombert (2002) hypothesized a correlation effect between PA and reading skills, so regressions were not conducted. The other four studies were investigating a relationship between PA skills and oral reading. The type of relationship being sought was not specified; therefore, questionable about why multiple regressions were not conducted. Two variables need to have a strong positive correlation as a prerequisite to conducting multiple regressions to see if there is a predictive relationship. Further studies need to be done or current studies need to be replicated to find whether or not there is a predictive relationship between PA and oral reading in individuals with DS.

Second, positive correlations were found between PA and oral reading skills in individuals with DS. Pearson correlations were performed in all studies. Only one strong correlation was found between alliteration (also called onset oddity or initial sound detection in studies) and real word and/or nonword reading among studies. Some other correlations were found between phoneme deletion, first syllable deletion, phoneme segmentation, rhyme, and blending with real word and/or nonword reading; however, a strong collective trend was not found between studies.

The discrepancy in results could be due to the dissimilarities in assessment tasks. All studies conducted the same range of concepts used in PA (i.e., rhyming, segmentation, blending, alliteration, etc). All studies, except one, looked at PA at the word level. Verruci, Menghini and Vicari (2006) performed PA tasks at the syllable level. Measuring PA at the word level or syllable level present with different complexities. This does not allow for a fair comparison between PA tasks and the subjects.

All studies assessed the same reading skills. Gombert (2002), Roch and Jarrold (2008), and Verruci, Menghini and Vicari (2006) used informal methods of assessing reading; whereas, Cupples and Iacono (2002) used formal measures only. Fletcher and Buckley (2002) and Kennedy and Flynn (2003) used both informal and formal methods of assessment for oral reading. Formal and informal assessments cannot be comparable at the same level. The formal tests were norm-referenced towards the typical population and not the DS population. Informal assessments did not consider blinding procedures to avoid influences on internal validity. Therefore, assessing individuals with DS can lead to differences in results due to unfair grounds of comparison, even though all assessment measures were looking at oral reading outcomes.

Differences in results could also be due to the various age ranges. Reading skills are not universal due to individual variations in sub-domains of reading skills in this population (Roch & Jarrold, 2008). Some participants were receiving early reading instruction or support from children centres, as well as attending

This critical appraisal of relevant research found that phonological awareness does not predict oral reading in individuals with DS. There was, instead, a positive correlation between alliteration and real word and/or nonword reading. However, these results were not strong enough to suggest clinicians to employ PA skills to teach oral reading to individuals with DS.

It should be noted that clinicians should not be using PA skills to help oral reading in individuals with DS. Individuals with DS have better visual skills than their verbal skills Snowling, Nash, & Henderson, 2008). Therefore, visual strategies need to be used to help this population with literacy (e.g., reading). The strengths children with DS have should be used to help them read and become skilled readers in later life.

More compelling evidence is needed before SLPs consider or put into practice teaching children with DS PA skills to aid with reading. Overall, current evidence does not suggest implications for clinicians to use PA skills for oral reading in this population of DS.

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