

Phonological Awareness in Specific Language
Impairment, Attention Deficit Hyperactive Disorder,
and Cochlear Implants Users

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List of Abbreviations

Abb.	Meaning
ADHD	Attention deficit hyperactive disorder
BPW	Blending phonemes into words
BSW	Blending syllable into words
CEPA	Spanish abbreviation for grouping. como criterio para la clasificación de los grupos. Standard questionnaire for learning disability.
CI	Cochlear implant
CONFIAS	Consciência fonológica: instrumento de avaliação sequencial (phonological awareness test).
DSM IV	Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition)
EF	Executive functions
HA	Hearing aid
IIP	Isolation of initial phoneme (sound)
LD	Learning disability
NH	Normal hearing
NLD	Normal language development
PA	Phonological awareness
PK	Print knowledge
SLI	Specific language impairment
WM	Working memory

Introduction



INTRODUCTION

Phonological awareness (PA) refers to the explicit awareness of the abstract units that compose spoken words, including syllables, onset and rime units, and individual phonemes. Phonological awareness is a critical precursor to the acquisition of reading (*Stanovich, 2000*).

Reading is the process by which one constructs meaning from printed symbols. It is a language-based activity; therefore deficits in oral language will be reflected by deficits in written language (*Supple, 1998*).

The brain recognizes language in a hierarchical order. The upper levels of the hierarchy deal with semantics (the meaning of words), syntax (grammatical structure), and discourse (connected sentences). The lowest levels of the hierarchy deal with breaking words into separate small units of sound called phonemes. Thus, before words can be comprehended at higher levels in the hierarchy, they must be decoded at a phonological level. This phonological processing takes place automatically at a preconscious level in spoken language. A genetically determined phonological module automatically constructs words from phonemes for the speaker and deconstructs the words into phonemes for the listener. Speech is instinctive; it is the exemplary biological human trait. The alphabet, conversely, was created 5000

years ago to give speech concrete representation at the phonological level. Thus, reading is an invented artifact that must be learned on a conscious level. Reading is a difficult task because 'the reader must learn to listen with his eyes'. The reader must realize that the orthography, the sequence of letters on a page, represents the phonological structure of words (*Shaywitz, 1998*).

Development of phonological awareness:

Phonological awareness is not a unitary skill. Words can be broken down into smaller units in at least three ways. The three phonological units that are most widely accepted (*Stanovich, 1992; Hoien et al., 1995*) include:

- Syllabic: the awareness of syllables in words (e.g. democracy: /də - mok - ræ - sii/)
- Intrasyllabic: the awareness of onset and rime. The onset consists of the initial consonant or consonant cluster, and the rime consists of the vowel and any proceeding consonants (e.g. dog: /d – og/)
- Phonemic: the awareness of individual sounds in words (e.g. dog: /d – o – g/)

In general phonological awareness develops first at the syllable level then at the intra-syllabic level of onset-rime and finally at the phoneme level (*James, 2002*).

Segmenting sentence into words, phoneme grapheme correspondence, and producing multisyllabic words are developed at the age of 5years 6month to 6years 5month. Isolating (initial-middle-final) phonemes, blending (onset & rhymes) into words, and recognizing rhyming words develop at the age of 6years 6month to 7years 5month. Segmenting words into phoneme, deleting final and middle phonemes develop at the age of 7years 6month to 8years 6month (*El-Sady et al., 2011*).

Specific language impairment (SLI), attention deficit hyperactive disorders (ADHD), and hearing impairment including children using cochlear implant (CI), are three disorders that affect children in early literacy acquisition. The pathophysiology of affection may differ and the causes may be multifactorial.

SLI and developmental dyslexia (also known as specific reading disability) are common developmental disorders that have a serious impact on a child's educational and psychosocial outcome. SLI affects around 3%– 10% of children (*Tomblin et al., 1997*) and is diagnosed when oral language lags behind other areas of development for no apparent reason (*Leonard, 1998*). Similar prevalence levels are reported for developmental dyslexia, which is identified if a child has poor literacy skills despite adequate intelligence and opportunity to learn (*Snowling, 2000*). In both SLI and dyslexia, the diagnostic criteria specify that the child has to have adequate hearing and no

major handicapping condition that might interfere with learning (*Dorothy et al., 2004*).

Karen (2010) found a significant difference between children who were normal and children who were SLI in phonological awareness skills. Children with dyslexia or a combination of dyslexia and SLI performed significantly less on measures of phonological processing than did children with SLI only and those with normal development. However Hug et al., 2005, stated that children with SLI only showed mild deficits in phonological processing compared with typical children.

The characteristic features of children and adolescents with **ADHD** are excessive motor activity, inattention, and impulsiveness (*Palacios et al., 2005*). Phonological awareness problems have been reported in children with ADHD. However, other researchers found that phonological awareness problems appear only in children with learning disabilities. *Gómez-Betancur et al. (2005)*, had found that children with ADHD without learning disability performed similar to normal children on phonological awareness tasks.

While *Palacios et al. (2005)*, found a significant negative relationship between hyperactivity and reading skills and concluded that ADHD and reading disability are two common childhood disorders, which frequently co-occur. Research estimates the co-morbidity of reading disability in children with ADHD between approximately 20–40% (*Del’Homme et al., 2007*).

Cochlear implants (CI) benefits deaf children's speech perception, language development and speech production. Early fitting of an implant results in improved outcomes (*James, 2002*). According to *James (2002)*, phonological awareness in cochlear implant users developed along a similar trajectory to hearing children. Syllable awareness was equivalent in the cochlear implant group to hearing children; while awareness of rhyme and phonemes was significantly delayed, but was equivalent to the profoundly deaf children using hearing aids. On the other hand, *Rastegarianzadeh et al. 2014* showed that children with cochlear implants were outperformed by their normal hearing peers in the area of phonological awareness, especially in phonemic awareness.