

# Reading: Children with Down Syndrome

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## Abstract

*Understanding the learning profiles of children, when teaching reading, affects the progress of their reading, in particular for children with Down syndrome. Specifically teaching word recognition, phonological awareness, orthographic knowledge, and comprehension, while understanding the ways in which children with Down syndrome learn, will support their communication and ultimately their inclusion in society.*

Reading offers a certain amount of autonomy to people and is a learned skill. There is print everywhere, and it is used for many reasons to communicate. Children with Down syndrome need this skill, as well. In the past there were beliefs that children with Down syndrome could not learn to read, but those beliefs have since been proven incorrect (Loveall & Conners, 2016). When teaching reading, I have determined multiple integral components, such as word recognition, phonological awareness, orthographic knowledge, and comprehension. Each component requires specific teaching for all children, but in particular children with Down syndrome and their particular learning profile. Comparing the learning profile of a typically developing child to the learning profile of a child with Down syndrome helps educators to understand the process of reading for children with Down syndrome. This understanding must be part of the education of teachers, in order to provide them with the tools they require to teach reading. Intervention as applied to the components of reading should take into consideration the whole child in order for it to be successful (Oelwein, 2009).

The learning profile for reading by a child is quantified by using data from reading assessments. The child's strengths and challenges are used to focus instruction to meet his/her needs. The same is true for children with Down syndrome. It is necessary to take into consideration the strengths and challenges of short-term memory, verbal memory, visual memory, and the stages of reading. Children with Down syndrome have relative strengths in visual memory but have challenges with short-term memory and verbal memory, which determine how they learn to read (Ratz, 2013). Performing reading assessments to build a reading profile for children with Down syndrome will begin and support the reading education of the child. Assessing is not teaching, but it provides educators with the knowledge that they need to teach (Oelwein, 2009). In building a learning profile, we must also take into consideration some of the road blocks that may arise that are not academic but physiological or based on misunderstandings. Motivation, attention, vision, hearing, or thyroid problems may all play a part in the learning profile of a child with Down syndrome (Oelwein, 2009). Having the learning profile of children with Down syndrome will help to build programs specific to their needs.

The whole-word approach to reading has been a common approach to reading for children with Down syndrome (Ratz, 2013). There is some evidence that, because of the visual memory strength of children with Down syndrome, there is the possibility that word recognition is a relative strength and the first steps for them in reading. This strength can be the reason that the fluency and accuracy of children with Down syndrome is at a higher level than what would be expected from their general reading skills (Naess, Lervag, Hulme, & Lyster, 2012). Learning sight words and recalling those sight words involves the rote process. Although children with Down syndrome have better visual memory and are better with visual learning, limiting instruction to rote memory of sight-words can prohibit the learning by these children (Cologon, 2013). Using the visual strength of children with Down syndrome helps them to begin as logographic readers, but they should not be limited to just this whole-word approach.

Phonological awareness is another piece in learning to read, and is part of reading development in children with Down syndrome (Burgoyne, 2009). Phonological awareness is

“becoming aware of the sounds within spoken words” (Clay, 2016, p. 92). Short-term memory and verbal memory are limitations that need to be considered when working on and assessing phonological awareness in children with Down syndrome (Fletcher & Buckley, 2002). Most of these children can learn phonological awareness, but it is more difficult than other reading strategies because of specific limitations in their learning profile (Naess et al., 2012). There is evidence that early phonological awareness instruction helps children with Down syndrome learn and “should include rhyme, syllable, and phoneme awareness” (Naess, 2016, p. 186). Understanding the strengths and limitations of phonological awareness in children with Down syndrome should be considered, when teaching children with Down syndrome to read.

Orthographic knowledge has not been researched with typically developing children or children with Down syndrome as deeply as phonological awareness, but it has enough importance in reading skills to be included in the discussion (Loveall & Conners, 2016). Orthographic knowledge is the understanding of word sounds and putting them down in written form (Conrad, Harris, & Williams, 2013). Children with Down syndrome are stronger with word specific orthographic knowledge than general orthographic knowledge (Loveall & Conners, 2016). As mentioned previously, short-term memory is a deficit in children with Down syndrome. Repeated exposure to skills helps to transfer knowledge from short-term to long-term memory. The amount of exposure that children with Down children have to orthographic skills and writing will solidify their understanding of these skills (Conrad et al., 2013). Orthographic knowledge is connected to phonological awareness, and for children with Down syndrome must be taught explicitly while taking their strengths and challenges into consideration.

Word recognition and phonological awareness are key pieces for beginning readers, but readers then advance to the more complex part of reading: comprehension. Listening comprehension is the understanding of oral texts, and reading comprehension is the understanding of written texts (Roch, Florit, & Levorato, 2012). Children with Down syndrome have lower scores than typically developing children in both reading and listening comprehension (Laws, Brown, & Main, 2016). Comprehension is the main goal of both listening and reading, and is an important part of being autonomous and a reader.

Listening comprehension occurs regularly throughout the day for all types of learners. There are spoken directions, oral stories, and spontaneous conversation, to name a few. In all of these situations, listening, processing, and comprehending are necessary steps. Children with Down syndrome have verbal short-term memory challenges, which cause challenges with listening comprehension (Levorato, Roch, & Florit, 2011). Holding onto a large string of information is a challenge, and the strategies must be taught. Assessment of listening comprehension is affected by expressive language and verbal memory, so these must be taken into consideration when assessing listening comprehension of children with Down syndrome (Roch et al., 2012). Children with Down syndrome tend to have stronger receptive language than expressive language for various reasons, so simply assessing in a manner that includes oral response and verbal memory, two of their deficits, would not provide accurate information. When working with children with Down syndrome, it is necessary to support their listening with visuals in order to increase their listening comprehension.

Reading comprehension is also lower in children with Down syndrome than in typically developing children, but is more of a strength than listening comprehension (Roch & Levorato, 2009). Children with Down syndrome have similar profiles to students considered poor comprehenders: poor language skills, limited vocabulary, and challenges with memory skills (Burgoyne, 2009). The evidence suggests that language level can make a difference on reading comprehension (Nash & Heath, 2011). Low language level will make a negative difference and a higher language level will make a positive difference. Vocabulary abilities are linked to the ability to learn to read (Hulme et al., 2012). The stronger the vocabulary strengths of children with Down syndrome, the better the reading growth (Steele, Scerif, Cornish, & Karmiloff-Smith, 2013). The visual memory of children with Down syndrome and the amount of processing resources necessary for the task affect reading comprehension. Visual memory is a strength

and has a positive effect on reading comprehension, whereas the higher the need for processing, the more negative effect on reading comprehension (Roch & Levorato, 2009). Reading comprehension is possible with children with Down syndrome.

While assessing children with Down syndrome and building intervention plans for their reading, all areas of the children and their reading profile must be considered and created specifically for those with the syndrome (Steele et al., 2013). Children with Down syndrome have a relative strength in word recognition because of their visual memory strength. There has been a pattern of using only the whole-word approach to teach reading to children with Down syndrome (Baylis & Snowling, 2012), but we should not limit their learning by offering only one strategy (Cologon, 2013). Phonological awareness training can make a difference for reading progress in children with Down syndrome (Baylis & Snowling, 2012), particularly in word recognition and decoding skills (Mengoni, Nash, & Hulme, 2014). Orthographic knowledge is stronger for actual word recognition than non-word reading (Loveall & Conners, 2016), so we should build the orthographic knowledge of real words by children with Down syndrome. While building a strong base of word recognition, phonological awareness, and orthographic knowledge, intervention plans must also incorporate reading comprehension. Listening, reading, discussing, and writing about a text will build vocabulary, word recognition, and receptive and expressive language skills while improving reading comprehension (Baylis & Snowling, 2012). All of these components must be part of an intervention plan for children with Down syndrome.

Teacher training for mainstream teachers does not include a significant amount of special education content. Down syndrome is an extremely prevalent genetic cause for learning disabilities (Hulme et al., 2012), so it is important that both teachers in training and practising teachers be provided with the information on how to teach reading to children with Down syndrome (Cologon, 2013). Having a support team for the children and the regular classroom teacher will help to provide what is needed for these children to learn and the teachers to teach them (Oelwein, 2009). Teachers in training and practising teachers must have training on how to teach reading to children with Down syndrome.

In conclusion, word recognition, phonological awareness, orthographic knowledge, and reading comprehension must specifically be taught to all children, but in particular to children with Down syndrome in a way that is conducive to their reading and learning profile. Teacher education must include the different ways to intervene in reading for children with Down syndrome because of the prevalence of these children in our regular stream classrooms. Successfully teaching children with Down syndrome to read provides them an effective mode of communication, which in turn supports their inclusion in society, their contribution to society, and their autonomy.

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### **About the Author**

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