

# An Explanation of Crystallized Intelligence as it Relates to a Learning Disability

Crystallized Intelligence involves the ability to apply previously learned information to new material. Students with a deficit in this area are likely to have reduced vocabularies and limited background knowledge.

## **Links to Achievement in Reading and Math:**

Crystallized abilities, especially one's language development, vocabulary knowledge, and the ability to listen are important for reading. This ability is related to reading comprehension in particular. Low crystallized abilities may hamper an individual's ability to comprehend written text due to lack of vocabulary knowledge, basic concepts, and general life experiences that are needed to understand the text. Crystallized abilities, including language development, vocabulary knowledge and listening abilities are important to math achievement at all ages. These abilities become increasingly more important with age. Low crystallized abilities may hamper an individual's ability to comprehend word problems due to lack of vocabulary knowledge. They may hamper one's ability to learn basic math processes, such as long division, due to impairments in one's ability to listen and follow sequential directions.

## **Links to achievement in Written Expression/Oral Language:**

Crystallized abilities, such as language development, vocabulary knowledge, and general information are important to writing achievement after age 7. These abilities become increasingly more important with age as students are required to draw upon previously learned vocabulary and experiences to generate compositions. Crystallized abilities, especially one's language development, vocabulary knowledge, and the ability to listen are important for both listening comprehension and oral expression. Low crystallized abilities may hamper an individual's ability to comprehend oral communication due to lack of vocabulary knowledge, basic concepts, and general life experiences that are needed to understand the information being presented.

Long Term Retrieval involves the ability to store and retrieve symbol names over a period of time, holding the information in memory while attending to new information. Students with a deficit in this area may have difficulty such as learning the names of the letters of the alphabet or memorization of math facts.

## **Links to Achievement in Reading and Math:**

Long Term Retrieval abilities are particularly important for reading. For example, elementary school children who have difficulty naming objects or categories of objects rapidly may have difficulty in reading. Associative memory abilities also play a role in reading achievement. Long Term Retrieval abilities are important to math calculation skills. For example, students with deficits in long term retrieval may have difficulty with basic addition, subtraction, multiplication, and/or division facts when encountered within a math problem.

### **Links to Achievement in Written Expression:**

Long Term Retrieval abilities and naming facility in particular have demonstrated relations with written expression, primarily the fluency aspect of writing.

Short Term Memory is the ability to apprehend and hold information in immediate awareness and then use it within a few seconds. Working memory, a subcomponent of short term memory, includes the ability to attend to and immediately recall temporally ordered elements in corrected order after a single presentation, as well as, the ability to store temporarily and perform a set of cognitive operations on information that requires divided attention.

### **Links to Achievement in Reading and Math:**

Short Term Memory is important to reading achievement. Reading comprehension, involving long reading passages, may be affected by skills specifically related to working memory. Basic word reading may be impacted by deficits in short term memory because it may interfere with acquiring letter and word identification skills. Short Term Memory is important to math computation skills. For example, deficits in short term memory may impact one's ability to remember a sequence of orally presented steps required to solve long math problems.

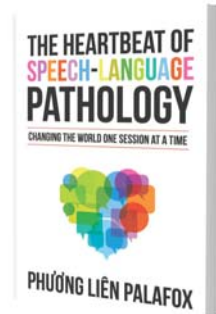
### **Links to Achievement in Written Expression/Oral Language:**

Memory span is especially important to spelling skills, where working memory has shown relations with advanced writing skills. A student with short term memory deficits may have problems following oral directions because they are unable to retain the information long enough to be acted upon. A student with short term memory deficits may have problems with oral expression because of difficulties with word -find or being able to retain information long enough to verbally express it.

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