

The Science of Communication

Verbal language is one method of communication that most people use to maintain relationships and exist in today's society. The process of language is complex and has multiple components. A change in the left hemisphere of the brain, particularly the frontotemporal region and the parietal region of the left hemisphere in most right handed people may cause a change in language ability. Neuropsychologists evaluate language in children including receptive and expressive language skills such as word fluency, language comprehension, reading, writing and phonological processing. They also evaluate language skills in the elderly to determine the nature and extent of deficits in verbal fluency, comprehension, and confrontational naming. Neuropsychologists also evaluate language skills in individuals who have had insults to the brain such as traumatic brain injury. Impairment in language skills (receptive or expressive) is labeled aphasia. There are many different types of aphasia.

Broca's aphasia is defined as a nonfluent aphasia is also labeled "anterior" aphasia because of the location of the injury to the anterior portion of the speech zone in the left hemisphere of the brain. It also involves white matter and the precentral gyrus. Authors such as Heilman & Valenstein identify the left frontal lobe as an area involved in Broca's aphasia. People with Broca's aphasia have difficulty with fluent articulation, having difficulty expressing a clear, concise sentence with a noun and verb. They exhibit a reduced ability to express complex vocabulary. Their grammar skills are limited. They are able to comprehend auditory information. Reading skills are usually spared or mildly impaired and written language is difficult for the person to complete. People with Broca's aphasia are typically able to understand spoken language and gestures. This type of aphasia is also an impairment of motor speech.

Another type of aphasia that is characteristic of difficulty with fluency is Transcortical Motor Aphasia. This is usually due to small subcortical lesions close to or superior to Broca's area. The symptoms of TMA include restricted speech initiation. Impaired ability to produce spontaneous speech is present. Ability to repeat is relatively preserved. The person has difficulty organizing and starting responses in conversation. They may be able to answer with yes/no responses or name objects but have difficulty with fluent conversations that require sentences.

Wernicke's aphasia is usually identified when a person expresses more than one error in speech that has to do with meaning (semantic) in language. This occurs multiple times in their conversation. They exhibit speech that is fast and as if they need to say a lot in a short amount of time. The person has difficulty with comprehending what they hear (auditory comprehension). They sometimes repeat what the examiner is saying. They have much difficulty with finding the word they want to say. Wernicke's aphasia leaves a person impaired in reading and writing. Heilman & Valenstein identify Wernicke's area as the "storehouse of auditory word forms". The person's performance becomes more impaired as they are increasingly fatigued or are distracted. Lesions in the junction of the temporal-parietal lobes usually present behaviorally with speech errors similar to Wernicke's aphasia.

There are other forms of aphasia such as transcortical motor aphasia, transcortical sensory aphasia, and conduction aphasia. Each have characteristics that are usually specific to that

diagnosis. The person who has language difficulties would benefit from an evaluation of neuropsychological domains including the use of language; speaking, understanding spoken language, reading, writing, words, sounds of words, word endings, and classes of words that are produced, recognized or understood. The evaluation would include an interview of biopsychosocial history, medical history, family member or caregiver perception, and assessment in the form of testing of those skills. Oral and written feedback to the client is provided and also provided to the medical doctor and family if the client allows.

You may call Dr. Beverly Matthews at 217-876-7929 or 825-9010 to ask further questions or schedule an interview. Information for this article was taken from Heilman & Valenstein; *Clinical Neuropsychology* 4th edition and *The Assessment of Aphasia and Related Disorders*, 3rd Edition, Harold Goodglass.