



# Language Analysis Tool Detects Cognitive Dysfunction (20120188, Dr. Serguei Pakhomov)

Technology No. 20120188

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## TRADITIONAL VERBAL FLUENCY ASSESMENT FOR DETECTION OF COGNITIVE IMPAIRMENT

Tests of verbal fluency (VF) are widely used in neurological, psychiatric, mental health, and school settings. There are two main types of VF tests - phonemic and semantic. The phonemic test consists of naming as many words as possible in 60 seconds that begin with a specified letter of the alphabet. The semantic test consists of naming words belonging to a semantic category (e.g., animals). These tests have been demonstrated to be useful for characterization of cognitive impairment due to a number of conditions including neurodegenerative disease, psychiatric diagnoses, developmental disorders, as well as potentially transient impairment due to traumatic brain injury or cardiovascular accidents, and drug toxicity or metabolic effects. While clinically very useful, verbal fluency tests are currently administered manually and are too cumbersome for wide adoption on a large scale in fast-paced and overburdened health care systems. Manual VF testing is also prone to scoring subjectivity and variability, and cannot be easily self-administered.

## AUTOMATED VERBAL FLUENCY TEST FOR DETECTING COGNITIVE IMPAIRMENT

VF-Meter automates the administration and scoring of verbal fluency tests and makes them widely accessible and cost-effective. The technology uses computerized speech analysis algorithms on recorded audio files of people responding to a standard neuropsychological test of verbal fluency. VF-Meter can be easily administered on a variety of devices including the telephone, computer, tablet or a smartphone. The test results consists of estimates of the traditional verbal fluency score as well as a number of additional speech characteristics not available with paper-and-pencil testing.

## **BENEFITS OF VF-METER FOR DETECTION OF COGNITIVE DYSFUNCTION:**

- Lower cost solution that does not depend on specialized labor
- Standardized objectivity regardless of clinical expertise
- Faster results to increase efficiency and time to treatment
- Easy long-term monitoring of patient progression
- Ease of outreach to remote clinical locations via telephone or Internet

## **Availability of VF-Meter Software:**

The VF-Meter app is available for the iPad from the Apple Store. It is designed for test administrators for administering tests and collecting data.

The VF-Meter Server license is available to researchers who will use the software to collect, store and analyze spoken responses to neuropsychological assessments for research.

- Requires a Linux or MacOS 64 bit system with at least 4 Gb RAM and 8 Gb free disk space.
- Start the licensing process by clicking on the VF-Meter Server Research License in the right hand column.
- After you submit the license you will be contacted with information on how to obtain the software.

### **Researchers**

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[External Link](http://www.pharmacy.umn.edu) (www.pharmacy.umn.edu)

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