

## THE ROLE OF VISUAL PERCEPTION IN SPOKEN RESPONSES

Vahe E. Amassian<sup>1,2</sup>, Roger Q. Cracco<sup>1</sup>, Paul J. Maccabee<sup>1</sup>, Joan B. Cracco<sup>1</sup>, Alan P. Rudell<sup>1</sup>,  
Larry Eberle<sup>1</sup>, Ivan Bodis-Wollner<sup>1</sup>

*<sup>1</sup>Departments of Physiology and Pharmacology, State University of New York,  
Downstate Medical Center, Brooklyn, USA*

*<sup>2</sup>Departments of Neurology, State University of New York, Downstate Medical Center,  
Brooklyn, USA*

### **Abstract**

How subjects voice responses to flashed visual symbols was investigated at successive stages of the information processing. The representation exits from V1 mainly by 120-140, mean 130 ms; cortical motor output to voice onset has a mean delay of 85 ms. The latencies of voicing only a noise, blurting versus perceiving before responding correctly yield mean delays for perception (85 ms) and for spatio-temporal motor coding of digits (45 ms), with a mean total delay of 345 ms. Prefrontal cortex and Intralaminar N. also contribute to perception.

**Keywords:** visual perception, occipito-frontal flow, Broca excitability, TMS mapping