

NEUROMECHANICAL COMPONENTS OF REACTION TIMES FOR VOICE INITIATION

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This study investigated basic human sensory-motor processes underlying voluntary reaction time (RT) latencies for voice initiation through simultaneous aerodynamic, acoustic and electromyographic (EMG) recordings. Four adult subjects were pretrained to respond as quickly as possible following an auditory (1000 Hz sine wave) or a somesthetic (6 cm H₂O of intraoral air pressure release) stimulus. Each subject provided data on neuromechanical reaction time latency that is the period from the stimulus onset to the initiation of vocal response. The component of RT comprising mechanical time (MT), in this case the latency from the onset of the interarytenoid and or posterior cricoarytenoid muscle activity to the initiation of the vocal response was measured directly. When the MT component is subtracted from the RT, it yields values for neural time (NT), that corresponds to the latency between the stimulus onset and the onset of the EMG activity. Neural time component is subdivided into the three sequential stages of afferent, cortical and efferent time. These three neural stages are time estimated. All RT components are discussed with reference to the stimuli used, and the phonatory task accomplished. The NT component was shown to be variable while the MT was shown to be stable independently of stimulus type and or the overall RT latency. Implications of RT variability in reference to more complex phonemic-linguistic load are discussed. (Supported by UCSF MSF Grant No 16 and VA's MRS.)