STUDYING THE "NEURAL BEHAVIOR": A PERSPECTIVE ON BRIDGING THE GAP BETWEEN BEHAVIORISM AND NEUROSCIENCE AND ITS APPLICATIONS TO LANGUAGE TEACHING STRATEGIES

ABSTRACT

The purpose of my thesis is to point out the development of a particular line of research aimed at bridging the gap between the Neurosciences and Behavior Analysis, the science of behavior and learning, by studying verbal and non-verbal behavior in human brain through the use of functional imaging (fMRI) techniques. This research line has been developed to study events in the human brain which meet their overt counterparts (public responses) and to explore the potential practical clinical implications of extending the study of human behavior to brain processes (producing new cognitive-behavioral neuromarkers of neurological and psychiatric diseases and suggesting new strategies for teaching language to individuals with learning disabilities).

The first experimental application of this extended conceptual perspective consisted in an investigation of the possible correspondence between neural events and their public counterpart. This correspondence has taken the form of possible measures of behaviors in the brain.

A wide further aim of my work has been investigating the localization of the publicly observed behaviors in the brain, namely highlighting the brain areas where cerebral behaviors underlying public behaviors occur. This investigation has led to a detailed analysis of *verbal behavior* in the brain, which allows the study of language utterances from a behavioral perspective. This has been done by differentiating the neural activity patterns that are specific to each one of the classes of verbal behavior to whom B. F. Skinner gave the name of *verbal operants*, which also enables to point out the possible neural frame of reference for both the functional independence of the verbal operants (different environmental stimuli controlling the verbal responses in a differentiated fashion) and the multiple control of verbal behavior (some verbal responses being controlled by a particular set of stimuli).

Defining a common conceptual framework between Neuroscience and Behaviorism and systematically studying the single units of analysis of verbal behavior within the brain environment can lead to deriving considerations of applied nature, aimed at developing new teaching procedures for verbal behavior. Particular interest was devoted to the topic of the acquisition of complex verbal repertoires, specifically focusing on the analysis of the brain processes corresponding to the *intraverbal*, and possible *specific* teaching strategies were investigated based on the results of the study of the verbal operants in the brain environment.