Naming Disorders and Semantic Representations

Carlo Semenza,¹ Patrizia S. Bisiacchi, and Letizia Romani

Università di Padova

The status of semantic conceptual structures in aphasia was investigated with relation to naming disorders in spontaneous and constrained speech production. A battery of six tasks was administered to 25 control subjects and 25 aphasics: spontaneous speech production (from which the percentage of nouns was calculated), confrontation naming, understanding class relationships (verbal and pictorial), and understanding thematic relationships (verbal and pictorial). Results indicated the important role of taxonomic abilities for naming, while other conceptual structures (i.e., thematic relations) do not seem to play any important role in the process of naming. These results are discussed in terms of the internal organization of semantic information.

The “semantic” or “conceptual” system, as it is variably called in most models of naming derived from neuropsychological data (Allport, 1984; Kay & Ellis, 1987; Saffran, 1982; Shallice, 1988a), remains a very ill-defined and underspecified area. So far, the system has been described and investigated in aphasiology as a store containing semantic/conceptual information in either propositional or visual form (see Allport & Funnell, 1981; Shallice, 1988b; Warrington & Shallice, 1984). Less attention has been devoted to understanding the procedures, such as categorization, involved in the internal organization of the system, and to the extent to

This work was supported by grants to Drs. Semenza and Bisiacchi from the Ministero della Pubblica Istruzione and by the Consiglio Nazionale delle Ricerche Unità 14, Scienza del Comportamento.

¹ Address all correspondence to Carlo Semenza M.D., Dipartimento di Psicologia Generale, Piazza Capitanato, 3, 35100 Padova, Italy.
which the intactness of these procedures relate to the retrievial of names from the system.

The present study is a first attempt to investigate the status of semantic conceptual structures vis-à-vis naming disorders in both spontaneous and constrained speech production. We assessed naming in free production (measured as the percentage of nouns used in spontaneous speech) as well as in constrained production (in which the number of semantic errors in a naming test was considered as a direct measure of the semantic disturbance, since failure to name does not guarantee that a naming disorder is of semantic origin). These measures were correlated with adequacy of choice in two conceptual tasks, one consisting in judging a class relationship (class categorization) and the other in judging a thematic relationship (situational categorization).

For the purpose of this study a class relationship is defined as the existence of an identifiable superordinate shared by two objects or events; a thematic relationship is one that exists between two objects or events that are, from experience, known to occur contiguously in space and/or time. For example, there is a class relation between a violin and a guitar, while there is a thematic relation between a violin and its bow.

For the first conceptual task, which consisted of judging the degrees of a class relationship, there were reasons for predicting a relation with naming abilities. The basis for this prediction comes first generically from studies (Bisiacchi, Denes, & Semenza, 1976; Semenza, Denes, Lucchese & Bisiacchi, 1980) showing that Wernicke's aphasics who show naming disorders of semantic origin also fail on class tests (to a lesser degree, all categories of aphasics may show semantic errors—see Butterworth, Howard, & McLoughlin, 1984; Gainotti, Miceli, Caltagirone, Silveri, & Masullo, 1981; Shallice & Coughlan, 1980; Kohn & Goodglass, 1985—which was one of the reasons for not using traditional classifications of aphasia in the present study). Converging evidence derives also from Wayland and Taplin (1982) and Semenza (1985). More directly, however, this prediction comes from the works of Whitehouse, Caramazza, & Zurif (1978) and Caramazza and Berndt (1978, 1982). The latter, which sketches a model of the naming process, shows how object naming depends on classification abilities which permit the use of relevant perceptual information. In fact, after preliminary low-level analyses, in this model an active top-down component guides a parser to search the stimulus for the presence of "semantically" interpretable components. The parser uses information represented in semantic memory. Caramazza, Berndt, & Brownell (1982) showed that aphasic patients with manifest classification deficits (reflecting disorder of the semantic com-