# The Treatment of Anomia Resulting from Output Lexical Damage: Analysis of Two Cases

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This study describes a treatment project, carried out with two anomic subjects. RBO and GMA failed to name pictures correctly as a consequence of damage to phonological lexical forms; their ability to process word meaning was unimpaired. Words that were consistently comprehended correctly, but produced incorrectly by each subject, were identified. Some words were treated, whereas some served as the control set. A significant improvement was observed in both subjects. As predicted by the model of lexical–semantic processing used as the theoretical background for the study, improvement was restricted to treated items and did not generalize to untreated words, not even to words that were semantically related to those administered during treatment. Improvement was long-lasting, as shown by the fact that 17 months post-therapy GMA's performance on treated words was still significantly better than before treatment. These results are discussed in relation to the claim that cognitive models can be profitably used in the treatment of language disorders.   © 1996 Academic Press, Inc.

## INTRODUCTION

Failure to provide the correct name when presented with the corresponding picture is the most common finding in aphasia (Goodglass & Kaplan, 1983) and can be the only language disorder in the unusual patients with ''pure anomia'' (e.g., Kay & Ellis, 1985; Miceli, Giustolisi, & Caramazza, 1991). The pervasiveness and persistence of word-finding deficits have stimulated

several studies aimed at seeing if, how, and for how long they can be ameliorated. The results unanimously suggest that naming failures can be remediated to some extent and for some time (e.g., Basso & Chialant, 1992; Hillis, 1989; Howard, Patterson, Franklin, Orchard-Lisle, & Morton, 1985a,b; Marshall, Pound, White-Thompson, & Pring, 1990; Myers, Pease, & Goodglass, 1978; Patterson, Purell, & Morton, 1983; Podraza & Darley, 1977; Pring, White-Thompson, Pound, Marshall, & Davis, 1990; Seron, Deloche, Bastard, Chassin, & Hermand, 1979; Weigl, 1961, 1970a,b; Wiegel-Crump & Koenigsknecht, 1973). The present paper deals with two controversial issues related to recovery from anomia.

The first issue concerns which words are affected by treatment. Is recovery limited to treated words, or does it generalize to untreated items? If the latter were the case, does improvement generalize to all words, or to just some words—for example, to untreated words semantically related to the words used during treatment? The literature provides contrasting answers to this question. In early group studies (Seron et al., 1979; Wiegel-Crump & Koenigsknecht, 1973), widespread improvement was reported: treated words showed the greatest improvement, but untreated words in the same semantic category as the treated words, and untreated words from unrelated semantic categories also improved significantly. More recent studies have not reported such generalized improvements, but have described, instead, two contrasting patterns. In some single-case studies (Hillis, 1989; Hillis & Caramazza, 1992; Marshall et al., 1990) and in a group study (Marshall et al., 1990), the greatest improvement was observed on treated items, but performance accuracy on untreated words in the same semantic category as the treated words also increased, suggesting transfer of improvement within the same semantic domain. In other single-patient studies (Hillis, 1989; Hillis & Caramazza, 1992; Marshall et al., 1990) and in a group study (Howard et al., 1985), improvement was restricted to treated items. For example, Howard et al. (1985a) found that naming of a picture to which no response had been provided on baseline testing was facilitated if, before a further attempt at naming, the corresponding word was presented in a comprehension task, but not if another semantically related word was presented in the comprehension task. Thus, there is general agreement that naming accuracy improves following various types of prompts or treatments, but it is unclear whether treatment results in item-specific or generalized improvement and how one or the other outcome can be predicted or accounted for.

Cognitive models of semantic–lexical processing invite a more principled approach to this issue and encourage the search for theoretically driven predictions and interpretations of the various patterns of improvement (but see Caramazza, 1989). The model that provides the background for the present study (Fig. 1) has been discussed in detail in several publications (e.g., Caramazza & Hillis, 1990; Hillis & Caramazza, 1991; Miceli, Giustolisi, & Caramazza, 1992). The assumptions of the model that are relevant to the produc-