

RETRIEVAL PATHWAYS FOR COMMON AND PROPER NAMES

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ABSTRACT

Paradigmatic cases of proper name anomia and proper name selective sparing are reviewed from relevant neuropsychological literature. Available evidence supports the existence of functionally and anatomically distinct retrieval pathways for the categories of proper and common names. An information processing model whose main feature lies in the relative independence within the semantic-conceptual system of information concerning individual entities may account for most of the observed phenomena. Localization studies seem to indicate that a complex neural network sustains various tasks implied in proper name processing. A dedicated module dealing with proper name retrieval is probably there, but its location within the left hemisphere is not at present fully understood. The proper name specific retrieval process is shown, in keeping with current philosophical and linguistic theories, to be intrinsically fragile and source-consuming.

Key words: proper names, common names, anomia, individual semantics, general semantics

This paper will review neuropsychological findings on the retrieval of common as opposed to proper names in order to provide an up-to-date answer to the following questions:

1) Are common names and proper names retrieved via different processing and distinct neural pathways?

2) If the answer to the former question is yes then where in the course of retrieval does the difference appear? Does the difference depend upon the specific characteristics of the two categories?

3) Independently from answers to questions 1 and 2: Is proper names retrieval more difficult than that of common names?

An information processing model will be described accounting for available neuropsychological data.

THE DIFFERENT NATURE OF PROPER AND COMMON NAMES

The difference between the two categories of common and proper names is believed, according to a number of past and current theories (reviews can be found in Cohen and Burke, 1993; Semenza, 1997; Valentine et al., 1996; Yasuda et al., 2000), to lie in the kind of relation each name category has with its own reference. A synthetic account will suffice for the present purposes.

Proper names are thought to relate to their reference in a "token" (individual) as opposed to "type" (categorical) fashion, which is the case for common nouns. In other words, while proper names refer to individual entities, common nouns refer to categories of items. According to philosophers like Frege (1892) or, more recently,

Kripke (1980), proper names are pure referring expressions, in that they carry, beyond their reference, little if any sense or connotation. In other words, proper names do not entail any description of the entity they designate. Changing basic features and properties over time does not change the proper name of a given single entity. Another way of expressing this fact is to say that proper names have an arbitrary relation with their reference. As Semenza et al. (1998) have observed, a name designating a category applies to a set of attributes overlapping or interacting with each other via high-probability connections. In the set of attributes labelled by a proper name, instead, attributes combine together incidentally, being related to each other only by virtue of belonging to entities that are unique. This distinction resembles closely that universally made between semantic and episodic memory mechanisms but with an important difference: the mechanisms in question are more peripheral and operate at the lexical level.

CASES OF SELECTIVE ANOMIA

Studying the difference between proper and common nouns through the window offered by neuropsychological dissociations, has provided, in the past twenty years, the opportunity to explore the organisation of the lexical semantic system along a very important dimension, that of the amount of sense in Frege's (1892) terms, and to distinguish general semantics from semantics which refers to individuals. Indeed, several patterns of dissociation have been described in a variety of neuropsychological cases.

Cases were described of selective anomia for proper names, with normal retrieval of common names, and cases of the reverse pattern, proper name selective sparing, have also been reported. Both anomia for proper names and proper name selective sparing were observed in different syndromes. The careful investigation of such syndromes made the building of a theoretical model of proper name and common name processing possible entirely within the domain of neuropsychological research.

Anomia for Proper Names

Anomia for proper names has been so far observed in at least four varieties. The clearest cases for each variety will be summarised here with reference to the level of processing that is thought to be disturbed in each variety. All these cases are rare and follow focal lesions: however it has been shown that proper name relative to common name anomia is a rather common if not ubiquitous feature in the earliest stages of Alzheimer's disease (Semenza et al., 2003a) and that a difficulty with proper names is a very frequent complaint in the elderly.

Anomia in Accessing the Phonological Lexicon (Post-Semantic Proper Name Anomia)

This type of anomia was the first anomia for proper names reported in modern times in a non anecdotal fashion and constitutes the by far more frequently described variety. Indeed its description, and its investigation following a cognitive psychology approach, set a starting point for all subsequent neuropsychological investigations on the domain of proper names.

Two sub-varieties have been observed: one apparently including all categories of proper names (typically encompassing at least persons' names and geographical names) and one limited to the names of people. Patients P.C. and L.S. (Semenza and Zettin, 1988, 1989) belong to the first sub-variety, of which they still represent the clearest available examples. Patient T.L. (Lucchelli and De Renzi, 1992) represents instead the first and clearest example of anomia limited to people's names. Apart from this difference, the two sub-varieties show the same features and are subject to the same theoretical interpretation. Importantly, these patients never commit semantic errors on proper names and their failures are invariably omissions, often accompanied by spontaneous and accurate definitions of the target.

This anomia appears with equal severity in the oral and in the written modality.

Patients like P.C., L.S. and T.L. cannot retrieve proper names on picture confrontation, on definition and by category in one minute. Most of them seem little if not at all sensitive to phonemic as well as to

semantic cueing, but a combination of both types of cue has been shown to yield some improvement. Cases, however, have been reported, of patients showing a significant improvement when aided with a phonological cue consisting of the first phoneme of the name [Lucchelli and De Renzi's (1992) patient T.L. was indeed of this type, and others have been reported by Cohen et al., 1994, Moreaud et al., 1995, and Otsuka et al., 2005]. Cueing with first name is instead effective in most cases in eliciting, given the appropriate context, a famous surname (as in: 'A famous actor: Humphrey?'... 'Bogart'). All these patients forget a proper name they can immediately repeat orally on the investigator's input if the answer is delayed even for a few seconds and the interval filled with an interfering task such as counting backward. The administration of supra-span lists of proper and common names for immediate recall revealed, in the cases where this technique has been applied (e.g., Hittmair-Delazer et al., 1994), a significant decrement of the priority effect for proper name items only, as well as a lack of release from proactive interference in mixed lists where proper names constitute the second half of the list. Figure 1 reports the previously unpublished performance of patient L.S.

Retrieving a proper name from semantic memory thus seems to be these patients' problem. Semantics in itself is preserved. These patients can indeed tell all the information they know about the entity whose proper name they cannot retrieve and do not miss any bit of this information they knew pre-morbidly. The recognition side is intact: patients can easily match names to pictures and vice-versa. The integrity of the lexicon itself is testified by the fact that these patients can correctly read irregularly spelt proper names they cannot retrieve.

An important feature of this type of anomia is the collection of concomitant symptoms that, when looked for in cases where the dissociation between the two categories of names was neat (some of the reported cases describe rather weak dissociations) were invariably found. Semenza and Zettin (1989) first showed how their patient L.S. was unable to perform efficiently in the Wechsler paired associate learning test, where the items did not have a semantic relation. L.S. could learn all words in a list with the same efficiency of control subjects but he could never come up with a member of a semantically odd pair when given the other. Thus L.S. could never learn, no matter after how many attempts, to retrieve an item like "pear" when prompted with a semantically unrelated item like "clock". L.S. was found unable to match hardware items with their code number, a task he had performed all his working life. Also, he could not remember, and he could never relearn, phone numbers of people that he knew before his disease. Finally, he was asked to retrieve the titles of popular pieces of classical music that he showed to know by singing along and continuing correctly

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