

Proper and common names: A double dissociation

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Abstract

Proper name anomia and proper name sparing are unusual disorders characterized by a selective inability, or sparing, to retrieve proper names as opposed to common names. They may eventually demonstrate that these two categories of names are independently processed in the brain at the semantic or lexical/orthographic level. Yet, differences in patient assessment make comparison between cases difficult to interpret and raise alternative explanations to those dissociations, such as that they may be accounted for by the level of difficulty of test stimuli.

We describe two individuals, of identical age, gender and cultural background, with a complementary pattern of impairment of name retrieval following a left hemisphere stroke. ACB had an aphasic disorder with impaired naming, sparing proper names, while JFJ had normal language abilities and semantic knowledge about people, but a marked anomia for people's names. Patients were studied using the same material, thus overcoming methodological constraints pointed to previous work. These cases provide evidence of a double dissociation between proper and common names at the lexical access level. In addition, JFJ had a normal ability to retrieve historical and religious names suggesting that either these names are less difficult to retrieve or that they may segregate within the proper name lexicon.

Lesion of the left temporal pole was also dissociated. It was damaged in ACB but spared in JFJ, contradicting its crucial role in proper name processing.

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1. Introduction

The functional architecture of the cognitive system has been largely inferred from the study of individuals with acquired brain lesions, in particular in what concerns the neural organization of the lexical-semantic knowledge (Hart, Berndt, & Caramazza, 1985; Warrington & Shallice, 1987).

Regarding the neural representation of proper names, several case studies have shown that, following a cerebral lesion, people's names can be selectively affected (Hittmair-Delazer, Denes, Semenza, & Mantovan, 1994; Luchelli & De Renzi, 1992; Semenza & Zettin, 1988, 1989) or spared (Cipolotti, McNeill, & Warrington, 1993; Lyons, Hanley, & Kay, 2002; Schmidt and Buchanan, 2004; Semenza & Sgaramella, 1993) compared to common names, an evidence suggesting that they

are processed by distinct neuronal networks. These dissociations have been described at different cognitive loci (semantic level, phonological access, orthographic output, etc.), but mostly at the semantic comprehension level (Brédart, Brennen, & Valentine, 1997). However, the basis of such dissociation is still uncertain, due to the different nature of the experimental stimuli used and the lack of direct comparisons between cases.

In addition to individual case reports, data supporting a segregation between proper and common names has been provided by other sources, such as the patterns of lesion observed in series of patients (Damasio, Grabowski, Tranel, Hichwa, & Damasio, 1996), the record of daily errors produced by healthy individuals (Young, Hay, & Ellis, 1985), ERP studies (Proverbio, Lilli, Semenza, & Zani, 2001) and brain activation studies (Rotschtein, Henson, Treves, Driver, & Dolan, 2005). The latter have also suggested that the left temporal pole may play a crucial role in proper name retrieval, although this has been questioned by systematic reviews of published cases (Semenza, Mondini, & Zettin, 1995; Yasuda, Nakamura, & Beckam, 2000).

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The dissociation between proper and common names has been generally explained by their semantic uniqueness. While common names refer to concepts, proper names refer to single entities, do not contain attributes by themselves and are arbitrary, being considered “pure referential expressions,” i.e., labels which function is merely to refer to entities to which they are associated (Semenza & Zettin, 1989). In contrast, common names refer to a set of attributes that are shared by multiple entities within the same concept. As a consequence of that, proper names would have rather fragile associations to their unique reference, while common names would be represented in widespread neuronal networks that could be accessed and activated from different cognitive entries. Still another difference between these two categories of names concerns the alternatives offered to their retrieval (Brédart, 1993). Common names can often be substituted by synonyms while proper names become unspecific or unrecognizable, if partly substituted or omitted. All these features make proper names particularly difficult to learn and to retrieve by healthy subjects (McWeeny, Young, Hay, & Ellis, 1987), especially during normal ageing (Pluchon, Simonnet, Toullat, & Gil, 2002) and in the early stages of dementia (Semenza, Mondini, Borgo, Pasini, & Sgaramella, 2003).

We report two patients with naming impairments following a single left hemisphere stroke, who presented a contrasting performance between proper and common names, apparently at the access stage to the phonological lexicon. This double dissociation cannot be accounted for by the difficulty or complexity of the stimuli, since those were the same for both patients, nor by cultural differences between them, for patients were matched for age, gender and education. To our knowledge, this is the first report of a complementary impairment of proper names at this cognitive level. Lesion localization was also dissociated in what concerns the involvement of the temporal pole, and contrary to current theories on its role in proper name retrieval (Grabowski et al., 2001).

2. Case histories and background information

2.1. Case 1

JFJ, a 64-year-old right-handed lawyer, suffered a left hemisphere stroke that produced a mild fluent aphasia, a right-sided hemianopia and a mild right hemiparesis. The infarct involved the left infero-medial temporo-occipital cortex sparing the temporal pole (Fig. 1). As he recovered, he became aware of a marked difficulty to retrieve people’s names that extended, initially, to his own family and close friends’ names and made it impossible for him to return to work. He described this difficulty as a “tip of the tongue” phenomenon, for he had the subjective feeling that he knew the name, he could recall some visual or phonological aspects of it but could not retrieve it. JFJ was enrolled in a speech therapy programme and proper name testing took place during a 6-month period (2–8 months post-stroke).

By the time testing took place (Table 1) his performance was normal in all language tasks including reading aloud, reading comprehension and writing. Namely, he had no difficulty in reading proper names and extracts from newspapers were very much used as training material in rehabilitation.

There was no evidence of a general cognitive decline (Table 2). JFJ was fully oriented, had normal scores on the Mini Mental State Examination (Folstein, Folstein, & McHugh, 1975; Guerreiro et al., 1994) and in a dementia assessment battery (BLAD) (Garcia, 1984), although he scored below average when proper name retrieval was required (information subtest and the Mental State Questionnaire) (Khan, Goldfarb, Pollack, & Peck, 1960). Memory tests (Garcia, 1984; Wechsler, 1969) disclosed a mild anterograde memory and learning impairment, although this had no impact on his daily life. He could easily recall recent autobiographic information and kept updated about the news and his daily life. He had no difficulty in facial recognition (Benton, Hamsher, Varney, & Spreen, 1983). JFJ maintained

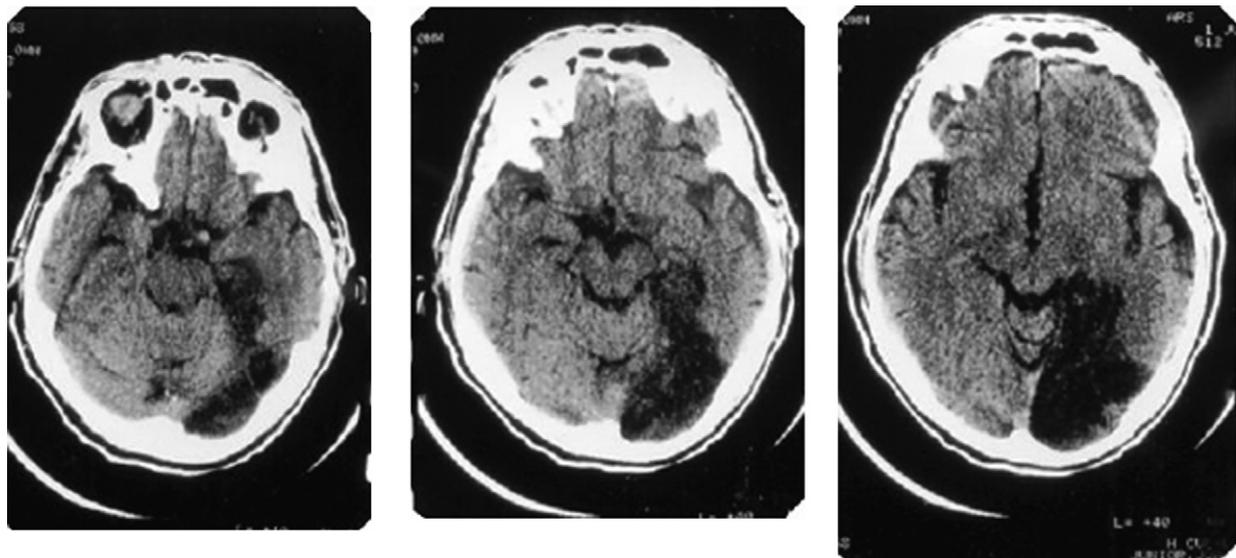


Fig. 1. JFJ-CT scan (3 months post-onset) showing a left hemisphere infarct, involving the occipital and the medial inferior temporal lobes, sparing the temporal pole.

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