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Dementia: When the Zebra Loses Its Stripes

The capacity to remember that a zebra has stripes, or that a giraffe is a four-legged mammal, is known as semantic memory. It allows us to assign meaning to words and to recall general knowledge and concepts that we have learned. The deterioration of these capacities is a defining feature of semantic dementia and can also occur in Alzheimer's disease.

A group of French neurologists and neuropsychologists have now identified the elements of semantic memory which are the first to deteriorate and may have thus explained why a surprising phenomenon known as hyperpriming can be seen in the early stages of Alzheimer's disease. Their findings are published in the January 2011 issue of Cortex.

Dr. Mickaël Laisney and colleagues, from the university hospitals of Caen and Rennes, studied the word-recognition abilities of 16 Alzheimer's patients and 8 patients with semantic dementia. The patients were shown pairs of words in succession and were asked to indicate whether they recognised the second word in each pair. Due to an effect known as semantic priming, people tend to more quickly recognise a word (e.g., "tiger") if they have previously seen a related word (e.g., "lion"), and a previous study had found this effect to increase further in the early stages of Alzheimer's disease, whereby patients recognised related words more quickly than healthy patients. This hyperpriming

phenomenon is surprising, because it is at odds with the idea of memory loss in Alzheimer's patients.

However, the findings of this new study have now shed light on the puzzle by showing that the first elements of semantic memory to deteriorate are the distinguishing characteristics of a concept, such as a zebra's stripes or a giraffe's long neck. This causes a blurring of closely related concepts, e.g., zebras and giraffes becoming generic four-legged African mammals, which the authors suggest as the reason why patients temporarily find it easier to recognise related words in the early stages of memory loss. The effect disappears in later stages of the disease.

Mickaël Laisney, Bénédicte Giffard, Serge Belliard, Vincent de la Sayette, Béatrice Desgranges, Francis Eustache. When the zebra loses its stripes: Semantic priming in early Alzheimer's disease and semantic dementia. Cortex, 2009; DOI: 10.1016/j.cortex.2009.11.001