Defining words: Taxonomic, perceptual, and functional knowledge

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What do we know about the words we use? The word definition task is a productive method for probing the structure of semantic memory. We use it to investigate what types of information are represented in word meaning. This topic has recently gained prominence owing to one theory of category-specific semantic disorders: Warrington and Shallice (1984) argued that these do not arise because of the neurological localization of different semantic categories, but because members of these categories are differentially represented in terms of their characteristic attributes. Living things depend primarily on perceptual information, while nonliving things depend primarily on functional information. Farah and McClelland (1991) tested this by examining dictionary definitions. We use a word definition task to examine directly how we represent word meaning.

Method

Participants

11 native English speakers (age range 18-37).

Materials

Ten words from ten semantic categories covering living and nonliving things were divided into two lists. (See Table 1.) One participant did both lists. We also included the categories of body parts (which the neuropsychological data imply should behave like nonliving things), fabrics, foods, gemstones, and musical instruments (which should behave like living things).

Procedure

Participants were asked to define each word as clearly as possible. They were tested individually with unlimited time.

Scoring

Three judges, one of which was naive about the area, checked the definitions. All responses were checked by at least two raters. Controversial items were discussed until consensus was reached.

Results

Participants clearly defined words using other types of information in addition to perceptual (P) and functional (F). In particular, taxonomic (T) information was frequently given. We used a category "O" for information that did not fall into any of the other categories. Table 1 shows the average number of instances of these per item in each category, and the ratio of perceptual/functional attributes.

Table 1: Mean number of mentions of attribute type per word for each semantic category.

CATEGORY	P	F	T	O	P/F
electricals	0.43	1.06	1.01	0.43	0.41
fabrics	0.66	0.96	0.88	0.51	0.69
vehicles	0.77	1.07	0.93	0.60	0.72
artifacts	1.13	1.24	0.86	0.11	0.91
body parts	1.01	0.89	0.75	0.15	1.13
instruments	1.01	0.49	0.11	0.30	2.06
gems	0.82	0.35	0.96	0.65	2.34
plants	1.34	0.42	1.04	0.33	3.19
animal	1.58	0.29	1.18	0.41	5.48
food stuffs	1.53	0.23	1.12	0.56	6.65

Participants usually mentioned taxonomic information first. (A curious exception to this is musical instruments.) As predicted, there is a clear division between categories reliant on functional information (P/F <1), comprising manmade objects, and those reliant on perceptual information (P/F>2), comprising living things and foods. Of most interest are the intermediate categories: body parts, which as predicted resemble artifacts, and body parts, gems, and instruments, which are close to living things. Clearly the category of fabrics is aberrant. There was no correlation between typicality and the perceptual-functional feature ratio.

The results provide further support for the idea that representations of living and nonliving things make differential use of perceptual and functional information. Other categories and types of attribute merit further investigation.

References

Farah, M., & McClelland, J. L. (1991). A computational model of semantic memory impairment. *Journal of Experimental Psychology: General, 120,* 339-357.

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