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Category

Fundamental to all learning and hence to culture is the categorization of experience. Sensory input, other than that evoking a reflex response, must be equatable with past sensory input if it is to have stimulus value. Learned responses are to stimulus categories, not to unique sensory inputs. Purposeful behavior, whether in humans or animals, is based on learning to relate categories of means to categories of ends. For a sensory input to have value as a stimulus with an associated learned response, it must be perceived as an instance or member of a categorical set.

Categories are fundamentally subjective. People objectivize them through language and other forms of symbolic representation. We tend to think of categories, therefore, as things that words designate. Words are, indeed, the means by which we are able to be aware of categories and their role in human cognition. But the categories that vocabularies designate are only the objectified visible tip of the much larger domain of categories in subjective cognitive processes.

Like other animals, humans are genetically programmed to find certain sensory inputs to be highly salient by contrast with others. Certain places on the range of color hues, for example, are invariant foci of reference for designating colors verbally, regardless of cross-linguistic differences in the number of basic color terms and the range of hues they are said to encompass. (Basic terms do not refer to natural objects, such as "grass color," and their referents are not perceived as subsets of what other terms designate.) Differences in color terminologies reflect differences in how people have clustered for verbal objectification the wider range of subjective color categories they distinguish perceptually.

Color categories illustrate the many kinds of categories, especially those based on direct sensory inputs, that are to be understand as "defined" by prototypic referents. These prototypes may be based on genetic proclivities (as with color), on primacy of experience, on intensity or frequency of

Journal of Linguistic Anthropology 9(1–2):24–27.

experience, or on some combination of these. Such categories have imprecise or fuzzy boundaries, as implied by describing something as "yellow-brown." Named land areas (spatial categories) in some societies are defined as the regions around focal landmarks, rather than the spaces between boundaries, with resulting zones of indeterminacy between them.

Basic categories are not perceived as composed of combinations of other categories. They can be defined only by pointing to illustrative examples, and many of them have no verbal representation as such in language. Most of the categories in terms of which people apprehend their world and events within it are complex, consisting of combinations of other categories. Complex categories that belong to non-overlapping complementary sets can be defined in terms of the constituent sub-categories by which they can be distinguished from one another (their distinctive features). Thus the sound categories that distinguish between the different words of a language—the languages phonemes—can be defined in terms of the combinations of phonetic categories that distinguish among them, such as voicing/non-voicing, mode of articulation, position of articulation, etc. The latter categories are basic and defined by focal points of reference, but the phonemes defined in terms of them are conceptually discrete even if their concrete articulation is occasionally fuzzily ambiguous. The purely conceptual categories of relationship variously designated by kinship terms in different languages can be defined only in terms of other conceptual categories. They are thus definable, through componential analysis, in terms of categories that serve as distinctive features discriminating among them. Some subcategories of relationship within the set of subcategories designated by a kinship term may appear as more focal within the set, serving as a stereotype for the set as whole. Thus where "mother" can refer to aunts as well as one's female parent, the latter may be described as "principal mother," revealing it to be the focal subcategory. The set of subcategories may also be defined in terms of extension rules applied to the focal one, the latter being distinguished from the focal subcategories of other sets by combinations of distinctive features.

Analysis shows that more than one set of distinctive features can reliably discriminate among verbally designated categories. Thus people may use a word denotatively in the same way while having different cognitive bases for doing so. Most drivers may stop at a red traffic light because they see it to be red, whereas some color-blind persons may stop because they perceive it to be at the top of the bank of lights. For people to have a sense that they share understanding about what percepts or concepts belong to a given category, redundancy in how it can be reliably defined is very helpful.

Categories tend to be organized in hierarchies. Basic categories, already mentioned, are those whose combinations produce and discriminate among other categories. Combinations of the latter in turn give rise to higher-level categories, and so on. Taxonomies exemplify elaborate, objectified categorical hierarchies, consisting of varieties, grouped into sub-species, then species, genera, families, orders, classes, and phyla. Research shows that verbal designation of categories tends to be (1) at a practical utilitarian level (akin to

that of genus): oak, elm, robin, canary, horse, elephant, tuna, whiting, bee, ant, chair, table, etc.; and (2) at a much higher, broadly encompassing level: tree, shrub, bird, animal, fish, insect, furniture, etc. Lower levels, when there is need to talk about them, are designated by descriptive expressions, often binomial ones such as white oak, weeping willow, striped bass, mountain goat, red ant, armchair, etc. This tendency is found cross-linguistically.

Experimental evidence shows that children tend to perceive words as designating categories that are mutually exclusive. They do not expect words to designate the same or overlapping categories. They learn later that words can refer to broader categories in a taxonomic hierarchy, "toy" encompassing both "doll" and "blocks." That people perceive some categories as more alike than others, even though they lack words for these hierarchical clusters, has also been established experimentally.

Since human learning is in terms of associations of categories of things, acts, persons, animals, and feeling states in various categories of relationship—such as means-ends, hierarchical, supportive—people attach differential value to them. Categories thus are not simply discriminated entities, they are good, bad, desirable, undesirable, etc., depending on how people have experienced them. Experiments show that people have richer associations with words designating nominal categories (things, persons, etc.) than with words designating adjectival ones.

Contextual association of categories of things and acts leads people to infer causal relations, which, formulated in words, become propositions. These associations lead to recipes for purposeful behavior. People order the conduct of activities, moreover, in terms of categories of situation, social identity, and context. How members of a family interact, for example, shifts with the arrival of a guest in their home, the category "guest" being a culturally significant contextualizer for how things are done, how language is used, and what things may be taboo. Since all perception is categorical, moreover, shifts in how one categorizes the same sensory or information inputs changes what one perceives, something that religious teachers, politicians, and trial lawyers, among others, seek to exploit to their various ends.

People organize their categories in many complicated ways, allowing some to co-occur and others not (as with foods) and some categories of person to enter into particular social relationships while prohibiting others from doing so (as with priestly celibacy). There are, as it were, grammatical and ungrammatical ways to associate categories, and some categories serve as contextualizing signals or markers that govern these associations.

Categories, moreover, are designated not only by words but by various other signs, including body language. Anything that makes a difference in how people perceive or respond to things marks a significant categorical difference. Human knowledge and beliefs and the organization of human activities and social relationships—indeed all of culture—is based on the categories humans construct out of experience and the ways in which they interrelate them.

(See also *brain, color, evolution, identity, maxim*)

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