Another Look at Salish Nouns and Verbs
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Introduction

In the ongoing debate about the universality of lexical categories, linguists have not yet reached a consensus on the categories of noun and verb. Some insist that the distinction between nouns and verbs must be universal. Robins 1952, taking a Whorfian perspective, attributed this to the fact that most linguists come from languages which have such a distinction and are unable to separate themselves from their conceptual/perceptual bias. A more recent author has argued that there is a "natural partitioning" in the world between objects and actions (Gentner, 1982).

Linguists also disagree on how nouns and verbs are to be defined and distinguished from each other. Recent work by Langacker (1987) suggests that there is a semantic basis for the distinction, while Hopper & Thompson (1984) suggest that the semantic characteristics of nouns and verbs are derived from their discourse function. Croft (1991) argues that there is both a semantic and functional basis for the distinction between nouns, verbs, and adjectives in the languages of the world.

Some Native American language groups (Wakashan, Salishan, and Chimakuan) are at the heart of this debate, initially because of Swadesh's (1936) claim, later supported by others, that Nootka did not have both nouns and verbs. Jacobsen (1979), in a subsequent analysis of Nootka, did find a distinction in noun and verb by examining the distribution of the lexical roots. There is a similar controversy for Salish. Several authors, Kuipers (1968), Thompson and Thompson (1980), and Kinkade (1983), have argued against the existence of nouns and verbs in Salish, while Van Eijk and Hess (1986) found evidence to support a distinction.

In this paper, I first summarize the arguments for and against a distinction between nouns and verbs in Salish. Then I discuss various recent attempts to characterize the nature of lexical categories in universal grammar. I propose a new way of looking at lexical categories which reconciles the differing accounts that have been presented for Salish and show how this theory emerges from the psycholinguistic evidence. I conclude that Salish has nouns and verbs, but not lexical categories.

The controversy

Kinkade (1983) thought that there was no convincing morphological, syntactic or semantic evidence to distinguish between nouns and verbs in Salish. He introduced the following data from various Salishan languages to support the thesis that 'any full word may constitute the main predicate of a Salishan sentence' (p. 27):

1. s-q̓á?-xn
   cont.-wedge in-foot
   'shoe'

2. q̓á?-xn (=q̓á?-xn- nt- n)
   shoe foot trans. I
   'I put a shoe on him.'

3. q̓á?-x-s (=q̓á?-xn- nt- s)
   shoe foot trans he
   'He put a shoe on him.'

4. pʼóx̣út
   father, parent (from Vogt 1940)

5. pʼox̣út-s
   father-his
   'He is his father.'

6. kʷ in-pʼox̣út
   you sg. my-father
   'You are my father.'

Although 'pʼox̣út' translates into the noun 'father' in English, it is, according to Kinkade, a stative predicate which can even take an imperative inflection.

Kinkade made an interesting observation about aspect as well. Main predicates must be marked for continuative (s-), stative (ʔac-), or completive (ʔit, etc.). The continuative form sq̓ʷíʔt'wn translates as 'it is burning' or 'the fire.' When the continuative prefix occurs with words like sƛ'aláɬ 'deer', it is often called a nominalizer, but Kinkade rejected that analysis, preferring a unified treatment. He believed that all predicates took the continuative aspectual marker. Thus, there are good grounds to argue that the same lexical root can function either as a predicate or as an argument, and therefore, that there is no real distinction between noun and verb in Salish.

Van Eijk and Hess (1986) reanalyzed the data, and came to a different conclusion. They suggested that two classes of lexical roots could be distinguished based on their ability to take possessive affixes. Those stems that can be made possessive correspond to our notions of noun; those that can't, correspond to our notions of verbs. Members of the verb class can be converted to the noun class by affixing the 'nominalizer' s-, and then they can become possessive.

7. ʾɬɬʼəm 'to sing'
   s-ɬɬʼəm 'song'
   n-s-ɬɬʼəm 'my song'

Unlike Kinkade, Van Eijk and Hess distinguish the nominalizer s- from the continuative s-. They also argue that other aspectual markers occur only with intransitive and transitive verb stems and not noun stems, concluding that although there is no hard and fast distinction at the level of syntax, there are sufficient morphological and morphosyntactic reasons to separate out nominal and verbal grammatical categories in Salish. These arguments are also convincing.

The theory

Theories about lexical categories fall into two types, which may be labeled **categorial** or **acategorial**. Categorial theories are those which posit that lexical roots can be divided into classes called nouns, verbs, and adjectives, but they differ in the criteria by which the roots are separated out, usually either by meaning or by form. Langacker's (1987) theory of lexical categories implicitly falls into this camp. In his view, 'all members of the noun class (not just central members) instantiate an abstract noun

schema, while all verbs elaborate an abstract verb schema' [1987:54). Thus, lexical categories are distinguished from each other by schemas or "templates" which their members share: Nouns all involve a set of interconnected entities in a cognitive domain while verbs involve 'relational configurations that necessarily extend through conceived time, and are scanned sequentially' (1987:75). Langacker differentiated his theory from meaning-based theories involving prototypes and radial concepts, but others, like Croft (1991), do not. There are also theories (Maratsos, 1982; Jakobsen, 1979) in which the members of the classes are mainly determined by the inflections that they take. One problem with a categorial view of noun and verb is that while all languages seem to have differences between nominal expressions and verbal expressions, the defining characteristics are not consistent from language to language and run the risk of subjectivity.

Hopper & Thompson (1984) presents an acategorial view. For them, lexical roots cannot be divided into lexical classes by meaning or form; rather, lexical roots acquire their categories by being placed into a syntactic structure. The extent to which each root fulfills nominal or verbal functions in the discourse will determine the degree to which the root has noun or verb characteristics. For Hopper and Thompson, lexical 'categories' are derived from discourse function, they are not inherently marked on lexical roots in the lexicon.

The theory that I present here is also acategorial, but it differs from Hopper & Thompson's in that I take as primary, not the discourse function, but the cognitive event which precedes the discourse or comes after comprehension of the discourse. I also draw on Langacker's insights about the templates that nouns and verbs involve but modify his claims for separate categories in cognition, because in a search of the psycholinguistic literature, I have found no evidence for a cognitive difference between nouns and verbs. In cognition, common nouns and verbs are essentially the same thing: predicates. (I am using the word 'predicate' with its philosophical sense: a predicate is any term which predicates category membership of some entity or event. It is, thus, similar to the word 'category' as used in psychology.)

To describe cognition (metaphorically), it is necessary to distinguish semantic memory from the mental lexicon. Semantic memory is a name given to the storage of generic meaning concepts or category concepts in memory; although obviously there are also associations with individual concepts and memory for persons and places. Concepts in semantic memory are wordless themselves, but fields of concepts are related to each other through associations of meaning. These fields of related concepts provide the underlayment for the mental lexicon, which contains entries based on the phonological and orthographic images of words. Contrary to the belief of many syntacticians, there is probably quite a bit of parametric variation in the languages of the world in the amount of explicit categorial labeling of items in the lexicon. Along with these two types of knowledge, semantic and lexical, underlying the use of lexical roots, there is a third type, called semantic operators (Johnson-Laird, 1983:413).

I suggest that this small set of cognitive or semantic operators interacts with the concepts and the lexical items to form composite knowledge structures composed of wordless concept, lexical item, and operator. The set of cognitive operators is universal; languages select some of the operators but not others, resulting both in variation and consistency across languages in the distinctions that are found in the syntax. I propose that NOUN and VERB are cognitive operators which have been selected by all languages in the world, and that there is parametric variation in the extent to which lexical entries mark category frequencies or preferences which must specifically match one or the other of the operators.

The NOUN operator takes a generic concept in semantic memory, and a lexical item and yields a knowledge structure which is an entity or a set of interconnected entities, as Langacker would say. The tripartite lexicalized concept refers to a real world or mental entity by predicating the concept/word of it. The VERB operator takes a generic concept in semantic memory and a lexical item and yields a knowledge structure which represents a process or a series of relational configurations which extend through time and are scanned sequentially, to borrow Langacker's terms again. This tripartite lexicalized concept is used to predicate that a certain 1, 2, 3, or 4-place relationship holds among entities.

Therefore, noun and verb are not really hard and fast categories at all; they are not even fuzzy categories built around core concepts of meaning. Rather, they are the result of a human cognitive need to organize perceptions and thoughts sometimes as entities and sometimes as modifiers or relationships between entities. The discourse functions that words have in expressing those thoughts and perceptions are secondary and dependent on prior cognitive and perceptual needs in adapting to and interpreting the world.

The psycholinguistic evidence

If categorial views are correct then a survey of the psycholinguistic literature should turn up ways in which nouns and verbs act differently. For instance, if lexical categories are distinguished by meaning, we might find cognitive differences between items from different lexical categories. We might find, for example, that all nouns and verbs are associated with each other in a semantic field or cluster around a prototype of 'object' or 'action.' If noun and verb are distinguished by inflectional class information or discourse function, then we should find some evidence that nouns and verbs are processed or remembered in different ways.

A review of the literature reveals that experimental investigations of form class have been a subject of interest since at least 1907, when, through one subject's introspection, it was suggested that the grammatical classes corresponded to different mental states. Wickens (1970) investigated whether a word, when perceived, was encoded in memory with some kind of tag that carried form class information as well as the semantic meaning. His idea was that if there were such a grammatical tag indicating category membership, verbs and adjectives would be encoded not only as individual items but also as members of different cognitive classes. However, Wickens found no difference in the encoding of words that could be attributed to lexical class and he concluded:

> In summary, I suspect that grammatical class is not a dominant attribute in the encoding of a single word. Perhaps the story would be different if the word were to appear in a grammatical context that is in a sentence or phrase, a circumstance which would necessarily impart grammatical flavor to each word. (page 4)

There are actually two points made here. First, Wickens found no memorial basis for supposing a distinction between the lexical categories he studied, and second, he seemed to feel after the fact that single words may not have grammatical markers associated with them in memory, but words that had been used in context might.

The second idea is addressed in some research by Johnson-Laird, Robins, and Velicogna (1974), which examined whether information about the lexical category of the content words in a sentence would be retained by the subjects

in memory or if that information would be lost after a conceptual representation of the sentence had been formed. After an empirical study investigating subjects' recall of whether, for example, "owner" or "owned" had been used to expressed the concept OWN in a sentence, their conclusion was that unless a subject consciously tried to retain the category of the word in memory (as one group of subjects was told to do), that information is lost in constructing the meaning of the sentence. Thus, even in context the lexical category information is not essential to the meaning of the word, casting some doubt on claims that formal properties or discourse function can be used to define lexical categories.

Another important technique that psychologists have used to study the organization of semantic memory is the free recall task. In this type of study, subjects are presented with a usually randomly arranged list of words from different categories and are then asked to write down the items they remember in the order that they recall them. The dependent measure for analysis is the amount of "clustering" found in the subjects' recall protocols. When two words of the same category are recalled together, they are considered a cluster, and the amount of clustering in a response list is taken to be an indication of the categorization imposed on the items, on the assumption that the categorization aids recall. Items that are thought to be from the same semantic category or that are associated in semantic memory will cluster together.

Studies including items from various categories like animals, names, professions, and vegetables have always showed significant clustering by category. This result has been replicated many times for different meaning-based categories. Research has shown that even when the items on the list presented to the subjects are totally unrelated, the subjects will impose a "subject-defined" categorization on them, and moreover, the subject-defined categorizations remain consistent although the items are reordered in subsequent trials. However, subjects will prefer a clear explicit organization over a subject-defined one.

Presumably, conceptual organization is reflected in semantic memory through the existence of semantic fields: fields of items that cluster together because of some underlying conceptual similarity or association. Thus, common nouns that refer to animals will cluster around some core concept of ANIMAL, categories of professions cluster around some core concept of JOB, and so on. We might hypothesize that there are core concepts involving notions like 'set of entities' or 'object' around which nouns cluster and 'relationship of entities viewed through time' or 'action' around which verbs cluster.

However, in a free recall cluster study done by Cofer & Bruce (1965), there was no evidence to indicate that subjects organized words by lexical category, even though that was the explicit categorization in the presentation list. They used 12 nouns, 12 verbs, and 12 adjectives that were unrelated otherwise in meaning and they presented them to the subjects in a randomized list and in blocks of 12 nouns, 12 verbs, and 12 adjectives. With the presentation in randomized order, there was no evidence of clustering at all, and surprisingly, even with the blocked presentation, there was only minimal clustering. Although a comparable group of subjects could identify the lexical class of the presented words, it appeared not only that lexical category was not perceived by the subjects in the experimental context but also that lexical category was not used as an aid to recall.

This is strong evidence against a categorial view, but in light of Langacker's suggestion that nouns and verbs instantiate core cognitive schemas, I decided to replicate Cofer & Bruce's free recall study using more controlled materials. My study included 5 proper names, 5 count nouns, 5 mass nouns, 5 perfective verbs, and 5 imperfective verbs from English. Strongly significant clustering based on comparison of ARC scores was found only for

the category of proper name, indicating that NAME is a grammatical category which may be based on a conceptual category from semantic memory. The other lexical categories showed negative clustering, i.e. they significantly did not cluster even as much as one would expect through chance. This result was presumably due to the fact that the non-name items were recalled in order of presentation, which was controlled to be non-clustered.

In summary, although clustering effects have been used throughout the past 35 years to demonstrate how words are organized in semantic memory by categories based on relationships of meaning, no cluster study has given any support to the idea that lexical classes (except for NAME) are based on cognitively real meaning distinctions. Indeed, there is no evidence to suggest even that discourse function or inflectional ending are psychologically real determinants of lexical category.

However, this evidence is consistent with the operator view. If semantic memory is organized by associations of lexical meaning and not by lexical category and if meaning concepts do not have inherent nominal or verbal categories, this would explain the Wickens' data as well as Cofer and Bruce's clustering study. My study shows that at least one lexical category (proper names) does have an underlying conceptual category, but common noun and verb do not. Johnson-Laird, Robins, and Velicogna showed that lexical category information, if computed at all from inflections and discourse function, is quickly discarded upon comprehension, leaving presumably only the meaning concepts themselves embedded in a conceptual structure. Discourse function seems to be useful for comprehension of thematic roles, but not for computation of lexical categories.

The natural language data revisited

Salish provides natural language evidence which clearly supports the acategorial operator view of nouns and verbs. For example, the meaning concepts underlying x̣ p- (dry) or p ozut (father) have no inherent nominal or verbal category and neither do the lexical roots. They are, as Kinkade and others suggested, predicates which cannot be differentiated into nouns or verbs by any inherent meaning. Then, in the course of human perception and conception of events and entities, the predicates acquire grammatical category in combination with either the NOUN or the VERB operator. Some concept/root combinations will occur more frequently with the NOUN operator and some with the VERB operator, but this is a matter of probabilities and preferences. Once the operator has applied to a concept/root combination, appropriate inflectional affixes may be added, giving rise to the situation as Van Eijk and Hess described, that lexical 'categories' can be distinguished by morphology and morphosyntax, as in Figure 1.

Up to this point, Salish is different from English only to the degree that lexical roots are specifically marked in the lexicon with their category frequencies or preferences. In English, such marking may be more common than in Salishan, because of the syntactic requirements. In Salish, since both 'nouns' and 'verbs' occur as predicates and arguments, there is little need for marking categorial information in the lexicon.

The theory presented here, which may be called the Universal Operator Hypothesis, resolves the controversy between those who argue that there is no distinction between nouns and verbs in Salish and those who argue that there is. There are noun uses and verb uses of the lexical roots, but there are no lexical categories. Also, since these cognitive operators are universal, then "nouns" and "verbs" are universal in the languages of the world, as, for example, Croft (1991) suggests.

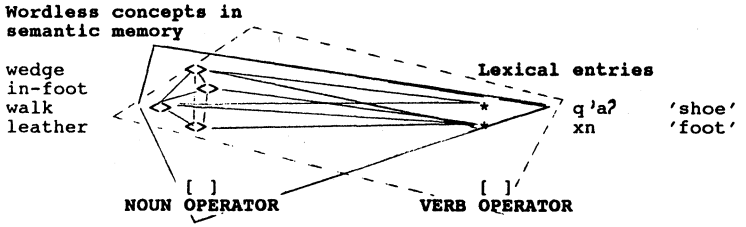

Figure 1. Wordless meaning concepts and lexical roots combine with cognitive operators, resulting in a nounlike word or a verblike word. Cognitive operators trigger or match inflections.

In my earlier work on the psychology of grammatical categories I also suggested that COUNT/PERFECTIVE and MASS/IMPERFECTIVE were two cognitive operators as well. Each of these operators can occur either with the NOUN operator or the VERB operator, reflecting the fairly common intuition that count is to nouns what perfective is to verbs and mass is to nouns what imperfective is to verbs (Bach, 1986, among others). It also reflects the observation that both nouns and verbs change aspect with great ease. If the continuative aspect s- is amenable to a similar analysis, as Kinkade suggests, the treatment of that morpheme can be unified.

Conclusion

I present here a psychological model of nouns and verbs as fluid and dynamic knowledge structures constructed from meaning concepts, lexical items, and the universal cognitive operators which range over them. This model was developed independently to account for some data from English, but it is equally useful for understanding the question of noun and verb in Salish. It strongly suggests that it is not that our language determines a division of the world into object-types and action-types, nor that the world is inherently divided into things and relations, which is then reflected in language. Rather, the primordial element is human cognition and perception, which interpret and construct the world as an experience ordered by entities and relationships. Entities and relationships are dynamically matched with lexical items with great variation and complexity in the world's languages.

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