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consider the fact that the apparently syntactic principles involved in compounding are only syntactic reflexes of semantic structures and regularities. The future task of the study of compounding will be to discover a semantically based theory of compounding (see Fanselow 1988).

See also: Compounds: Semantics and Pragmatics; Root Compounds and Synthetic Compounds.

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W. Motsch

Word-formation: Incorporation

The term 'incorporation' has been used broadly to cover various kinds of morphologization, whereby nominal, pronominal, adverbial, applicative, causative, or other elements are found within words, especially verbs. The term has traditionally been used in a specific sense to refer to 'noun incorporation,' the compounding of a noun stem with a verb to form a complex verb. Thus in Cayuga, an Iroquoian language of Ontario, the noun root *-ahy-* 'berry, fruit' is combined with the verb root *-kw-* 'get' to yield the verb stem *-ahyakw-* 'to berrypick,' the basis of verbs such as *kahyákwas* 'I am berrypicking.' The process has morphological, syntactic, and discourse ramifications: it creates morphological structures that can alter syntactic relationships within clauses and serve pragmatic functions in discourse. For these reasons, it is of special interest within linguistic theory.

1. Noun Incorporation

Noun incorporation is found in a wide range of genetically unrelated languages scattered throughout the world. It is especially common among languages indigenous to North and South America, Northern Australia, Austronesia, and Siberia, but it has also been reported for such well-known languages as Dutch. Noun incorporation performs several functions.

1.1 Basic Lexical Compounding

Most often, incorporation serves as a device for deriving lexical compounds to designate recurring activities or states that are noteworthy in their own right. In some languages this process is highly productive, in others more restricted, and in some, only relic compounds attest to its earlier productivity.

The degree of formal cohesion between the elements of the compounds varies. A noun and verb may be simply juxtaposed to form a syntactic unit, each retaining its status as a separate phonological word, as in (1) from the Californian language Central Pomo:

- | | | |
|--------------------|------------------------|-----|
| Maʔá | qaiwá:in | (1) |
| maʔá | qai-wá-in | |
| food | BITING-GO-IMPERFECTIVE | |
| '(He) was eating.' | | |

The formal bond between the noun and verb may be much tighter, as in Cayuga. All Cayuga verbs contain a pronominal prefix referring to the agent and/or patient, and a verb root. They may additionally contain other affixes and an incorporated noun stem, as in (2):

- | | |
|--|-----|
| kahyakwahskéhē:ʔ | (2) |
| k-ahy-kw-ahs-kéhē:ʔ | |
| 1.AGENT-berry-get-HABITUAL-FORMER.PAST | |
| 'I used to berrypick' | |

Several phonological processes in Cayuga operate over the domain of the word. If the penultimate syllable of a word is even-numbered, it receives stress. Note that in (2), the incorporated noun root *-ahy-* 'berry' enters into the syllable count, and the fourth syllable is stressed. Cayuga also contains a laryngeal 'spreading' rule whereby odd-numbered syllables ending in *h* are voiceless. Incorporated noun roots enter into the syllable count and participate in the devoicing, as can be seen in the first and third syllables of (2).

Incorporated nouns are not grammatical arguments of their clauses and thus carry no case marking. Their primary function is to qualify the verb, narrowing its scope semantically to pertain to the kind of patient, location, or instrument designated by the noun. They are not referential in the strictest sense. In Cayuga *-ahy-akw-* 'berrypick,' the noun root *-ahy-* 'berry' does not specify a particular berry: it describes a kind of getting. Because they are not referential, incorporated nouns are not inflected for definiteness or number.

1.2 The Manipulation of Case

A second function of noun incorporation in many languages is to provide lexical choices with alternative case structures. These permit speakers to cast important participants in 'core case roles.' Incorporation of this type is common with nouns referring to body parts. The patient of the Cayuga verb root *-hk* 'pick up,' for example, would normally be the object retrieved. The verb can be combined with the noun root *-nōh-* 'scalp' to yield a new transitive verb *-nōh-hk* 'scalp-pick.up' = 'to scalp.' Its grammatical patient is the person scalped.

athēnōhahk (3)
 a-t-he-nōh-hk
 FACTUAL-DUALIC-1.SG.AGENT M.SG.PATIENT-
 scalp-pick.up
 'I scalp-picked.up him' = 'I scalped him.'

With incorporation, the victim of the scalping, presumably of greater overall interest than the scalp, can occupy a core case role.

1.3 The Regulation of Information Flow

In some languages, incorporation is used to background known or incidental information within the discourse. When a significant entity is first introduced, it is usually expressed by an independent noun phrase, a form sufficiently salient to draw attention to the new participant. Once the entity is within the consciousness of speaker and hearers, it is often incorporated. This use of incorporation can be seen in the excerpts from a Cayuga telephone conversation below. A man called his friend and made the announcement in (4). The noun for 'my wallet' is separate from the verb 'I lost.'

Ni: kē: thōne:ʔ ōkahtō:ʔ akētkwēta:ʔ (4)
 I lost I lost my wallet
 'Mind you, I lost my wallet.'

After several exchanges, the caller closed with 'Well, if you see anyone, tell them that I lost my wallet.' At this point the wallet, now established information, was incorporated into the verb 'lose' as in (5):

ēkasheho:wiʔ shē ōketkwētāhtō:ʔ (5)
 I wallet lost
 'Tell them how I lost my wallet.'

Incorporation of this type is usually highly productive, since many different nouns can represent established information.

1.4 Classificatory Incorporation

In a number of languages, a verb containing an incorporated noun can be accompanied by a more specific external noun phrase that explicitly identifies the entity implied by

the incorporated noun. When the general Cayuga verb root *-ē-* 'have,' is combined with the noun stem *-nahskw-* 'domestic animal,' the new verb describes a particular kind of ownership, having a pet (6):

Akhnāhskwaēʔ (6)
 ak-nahskw-ē-ʔ
 I PATIENT-domestic animal-have-STATIVE
 'I have a pet.'

This complex verb can appear with a separate nominal referring to the particular animal, as in (7):

Sōtwats akhnāhskwaēʔ (7)
 sōtwats ak-nahskw-ē-ʔ
 dog I PATIENT-domestic animal-
 have-STATIVE
 'I have a dog.'

Classificatory incorporation also plays a role in the manipulation of the flow of information. An entity may be introduced into a discussion by a construction like that in (7), then its subsequent participation simply implied by the incorporated classificatory noun stem. The sentence in (7) is often followed by one like that in (8):

Kanāhskwiyo:ʔ (8)
 ka-nahskw-iyō-ʔ
 NEUTER-domestic animal-good-STATIVE
 'It's a good dog.'

Technically the sentence in (8) means that 'it is good in the way that domestic animals are good.' The incorporated noun *-nahskw-* implies that the referent of the pronoun *ka-* 'it' is the dog mentioned earlier.

2. Incorporation of Other Types

The term 'incorporation' has sometimes been extended to include the morphologization of other markers, particularly those that correspond to independent words within that language or in other languages. Pronominal affixes, like the agent and patient prefixes of Cayuga, have been described as incorporated (Bresnan and Mchombo (1987) on Chicheŵa). Applicatives, verbal affixes that affect grammatical relations and that are, in some languages, related to free adverbs or adpositions, have also been described as the result of incorporation (Baker 1988; Craig and Hale 1988). In many languages, verbs are derived from nouns by the addition of derivational affixes. The term 'noun incorporation' has been applied to such derivation in Greenlandic, which contains a large repertoire of such suffixes, many with concrete meanings (Sadock 1980).

3. Theoretical Issues

Because incorporation has morphological, syntactic, and discourse effects, there has been considerable discussion concerning its place in a formal model of language: in the lexicon, in the syntax, or in both (see Sadock 1980, 1985, 1986; Mithun 1984, 1986; Baker 1987; and Rosen 1989). Its place has major consequences for its description. On a lexical account, incorporation is seen as a derivational process that creates lexical items, with varying degrees of productivity, across languages. On a syntactic account, it is seen as the result of movement transformations; noun incorporation is accomplished by movement of a direct object noun phrase into the verb. Issues pertinent to the discussion involve the productivity of the process; the

degree of lexicalization of the structures it creates: the discourse opacity of word-internal morphemes in such structures, in particular, the referentiality of incorporated nouns; and the relationship of external nominals to incorporated nouns.

The extent to which the processes described in Sect. 1 and 2 should be considered a unitary phenomenon will depend on the kinds of characteristics they share. In an early article, Sapir (1911) maintained that only the kind of compounding described here in Sect. 1 constitutes true incorporation, explicitly excluding pronominal affixation and verbal derivation of the Eskimo-type from the category. The presence of pronominal allixes in a language can have substantial ramifications in the syntax, but apart from their status as bound morphemes, they share little with incorporated nouns. They are referential and usually do not have independent counterparts. Baker (1987) has argued that incorporated nouns, antipassives, causatives, applicatives, and passives, can be described in similar terms. Sadock (1986) posited several differences between verbal derivation in Greenlandic and noun incorporation in the traditional sense, but Denny (1989) has shown that the two serve much the same discourse function. It remains to be seen how many of the similarities among these processes are general properties of morphologization, and how many are unique.

See also: Morphology, Polysynthetic; Root Compounds and Synthetic Compounds; Word-formation: Compounding; Noun Incorporation.

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M. Mithun

Word-formation: Neo-Classical Combinations

Words like *antibiotic*, *astronaut*, *geography*, *technical*, and *thermometer* will be familiar to most native speakers of

English, while others such as *bibliophile*, *graphological*, *gerontocracy*, and *xenophobia* will likely be restricted to more educated speakers. Members of professions requiring an academic or scientific training will use many such words as technical terms: *etymologist*, *metalexigraphy*, *morphological*, and *neologism* belong, for instance, to the terminology of linguistics. All these words may be labeled 'neo-Classical combinations' for reasons discussed below. They may also be dubbed 'europeanisms' and 'internationalisms,' in that these English words have clearly recognizable equivalents in most other European languages, and they have accompanied the rise of modern science and technology and their spread throughout the world. Indeed, they make up the core of what *Webster's Third New International Dictionary* labels international scientific vocabulary (ISV). For all their familiarity and wide currency, however, their linguistic description generally still leaves much to be desired.

1. Terms and Concepts

1.1 Neo-Classical Combination

Synchronic morphological analysis reveals that *lexicography*, *graphology*, *diathermy*, or *thermal*--or their counterparts in French, German, etc.--are complex items that can be further segmented, for example, *lexico-graphy* or *lexic-o-graph-y*. However, they are neither compounds nor derivatives as traditionally defined: neither combinations of two (or more) free forms, nor of a free form as base and a bound form, namely an affix. First, they consist of bound forms only. Second, while some of these bound forms are allixes (*dia-*, *-al*), others are not (*therm*, *graph*). The latter can be combined with an affix to form a word (*thermal*) and thus act as a base. An affix, on the other hand, cannot function as a base: in combination with another affix it forms a complex affix, but not a word. Hence the use of the more generic 'combination' in preference to the more commonly found 'compound.'

Etymological study reveals, first, that the nonaffixal bound forms (*therm*, *graph*, *log*) are Classical (Greek) in origin; and second, that none of the combinations as such is attested in Classical Greek or Latin. Rather they are modern, post-Renaissance coinages, as indeed are most ISV terms, even when allowance is made for the many borrowings from Greek and Latin. They follow not only Classical word-formation patterns, but also new patterns developed in Neo-Latin and extended in the modern vernaculars, for example, copulative compounds like *historico-political* and *Italo-German*. Hence the use of 'neo-Classical' as found in the English literature.

1.2 Confix and Combineme

Of the various labels found in the literature for elements such as *graph*, *log*, and *therm* the internationalism 'confix' (French *confixe*, German *Konfix*, etc.) is preferred here to 'root,' 'stem,' 'compound element,' 'bound lexical base,' and to 'combining form,' the traditional English term introduced by the *Oxford English Dictionary* in 1884 (s.v. *aero-*). Like an affix, a confix is a bound word-formation item occurring only in combinations. Affixes and confixes may be subsumed under the superordinate term 'combineme' in contradistinction to 'lexeme,' the label for free forms, which may of course also occur in combinations. Unlike an affix,