Volumes in this series will be functionally and typologically oriented, covering specific topics in language by collecting together data from a wide variety of languages and language typologies. The orientation of the volumes will be substantive rather than formal, with the aim of investigating universals of human language via as broadly defined a data base as possible, leaning toward cross-linguistic, diachronic, developmental and live-discourse data. The series is, in spirit as well as in fact, a continuation of the tradition initiated by C. Li (Word Order and Word Order Change, Subject and Topic, Mechanisms for Syntactic Change) and continued by T. Givón (Discourse and Syntax) and P. Hopper (Tense and Aspect: Between Semantics and Pragmatics).

Volume 7

Colette Craig (ed.)

NOUN CLASSES AND CATEGORIZATION
TABLE OF CONTENTS

KAREN ADAMS
Numeral Classifiers in Austroasiatic 241

COLETTE G. CRAIG
Jacaltec Noun Classifiers: A Study in Language and Culture 263

IV SEMANTIC AND PRAGMATIC FUNCTIONS OF CLASSIFIERS 295

J. PETER DENNY
The Semantic Role of Noun Classifiers 297

PAUL J. HOPPER
Some Discourse Functions of Classifiers in Malay 309

A.J. BECKER
The Figure a Classifier Makes: Describing a Particular Burmese Classifier 327

PAMELA DOWNING
The Anaphoric Use of Classifiers in Japanese 345

V HISTORY AND ACQUISITION OF CLASSIFIER SYSTEMS 377

MARIANNE MITHUN
The Convergence of Noun Classification Systems 379

MARY S. ERBAUGH
Taking Stock: The Development of Chinese Noun Classifiers Historically and in Young Children 399

SCOTT DELANCEY
Toward a History of Tai Classifier Systems 437

KATHERINE DEMUTH, NICOLAS FARA CLAS, LYNNELL MARCHESE
Niger-Congo noun class and agreement systems in language acquisition and historical change 453

LANGUAGE INDEX 473

LIST OF CONTRIBUTORS 479

PREFACE

This volume contains the proceedings of a symposium on Categorization and Noun Classification held on the University of Oregon Campus in October 1984, under the sponsorship of the Linguistics Department, the Psychology Department, and the Cognitive Science Program.

I had initially approached T. Givon for some comments on a draft of a paper I had written on noun classification in Jacaltec Maya. His main comment was “Interesting! Let's have a conference and talk about it!” In his inimitable fashion, he took the list of references at the end of the paper and drew a preliminary list of participants. That's how the symposium on categorization and noun classification came to be. The participants were invited in an effort to bring various disciplines together — linguistics, psychology, philosophy, anthropology — and to gather a representative sample of the classifier languages of the world.

I wish to thank all those who participated enthusiastically and effectively in the work of the symposium. Not all symposium participants contributed a paper for the volume, and the volume includes a number of papers which were not presented at the symposium. These additions were sought in order to make the volume as comprehensive as possible on the matter of linguistic classification. A complete list of the contributors follows.

I am especially grateful to T. Givon for his supportive energy and to all the contributors for their cooperation in assembling the volume.

Colette G. Craig
A variety of languages, as typologically and geographically diverse as Mandarin (see Erbaugh) and Jacaltec (see Craig) share strikingly similar systems of noun classification. They resemble one another both in their repertoires of classifiers and in their uses of them. Is this similarity accidental, or does it reflect certain underlying forces, such as the categorial operation of human minds? Do such systems arise by chance, or teleologically? A different type of classifier system, also found in a variety of widely scattered languages, suggests that such classification is no accident. This second type of system, based on incorporated nouns, does not originate as an overt noun classifier system at all, but rather as a construction whose primary function is to qualify predicates. Over time, the construction can evolve into one whose secondary effect is to classify nominals overtly. The resulting system shares the primary functional characteristics of the prototypical noun classifying systems of Mandarin, Jacaltec, and others.

1. Incorporation

Noun incorporation is a lexical process whereby a noun stem and verb stem are compounded to form a derived verb stem, as in Australian Ngandi -gal- 'saliva' + -geyk-qa- 'to throw' → -galgeykqd- 'to spit' (Heath 1978). Incorporated nouns, like nouns in other compounds, do not refer; they qualify, narrowing the scope of their host verbs. The noun root -gal- in -galgeykqd- does not refer to a specific blob of saliva; it qualifies the type of throwing predicated by the host verb. Incorporated nouns are thus not marked for such distinctions as definiteness, specificity, or number. They have no syntactic role as arguments of the clause, although semantically they may qualify the patients, instruments, or locations of their host verbs. They are thus unmarked for case.
1.1. Stage I: New Compounds for new concepts

The process of incorporation develops in language in a predictable way (Mithun ms.b). It begins as a strategy for creating names for new categories of actions or states. A noun and verb are joined to form a single lexical item denoting an institutionalized, unitary concept. Not surprisingly, the resulting verbal compounds in a language typically reflect the cultural concerns of its speakers. In some cases, these may be relatively universal, such as Ngandi -y'i -‘thought’ + -ga- ‘hear’ — cyiyépgá- ‘to think’, or the compound from Caddo, a Caddoan language of Oklahoma, consisting of -nak- ‘fire’ + -a’nih- ‘make’ — -nak’a’nih- ‘to build a fire’ (Chafe 1977). In other cases, the compounds are more area- or culture-specific, as in the compounds from Cayuga, a Northern Iroquoian language spoken in Ontario, where -a’kr_ ‘snow’ + -anawé ‘to become wet’ — a’kranawé ‘for snow to melt’, or hka_ ‘peg’ + -ot ‘to stand’ — hkaot ‘to tap trees (by inserting a wooden peg).

1.2. Stage II: The manipulation of case

Once established, the process may be further exploited for the manipulation of case relations within clauses. When a noun is incorporated, its vacated syntactic role (subject, direct object, absolutive etc.) may not disappear, but rather absorb an otherwise oblique argument. A compound of this type is the Ngandi -magá- ‘neck’ + -gulk- ‘cut’ — magagulk- ‘to hang someone’. The verb remains transitive, but the possessor of the neck, more significant than the neck itself, is promoted to absolutive status and referenced in the pronominal prefix. The neck is backgrounded by incorporation to qualifying status.

(1) Ngandi (Australian, Heath 1978)
Baru-ga-maga-gulk-di ni-wolo ni-yul-0-yug.
3pl/Ms-sub-neck-cut-aug-past-prf Ms-that Ms-argnl-nom-abs
‘They hanged that aboriginal.’

Compounds of this type may be intransitive as well. When the subject of an intransitive verb is incorporated, an oblique argument may be promoted to the vacated subject (or absolutive) role. The Ngandi compound -ganam- ‘car’ + -dam- ‘be closed up’ — ganamdam ‘be deaf’ is of this type. The promoted possessor is referenced within the pronominal prefix, as before: qa-ganamdam ‘I am deaf’.

1.3. Stage III: The arrangement of information in discourse

In some languages the process may evolve still further into a mechanism for backgrounding known information within discourse. Such languages are typically polysynthetic, with obligatory pronominal affixes within the verb, as in the Ngandi qganamdam ‘I am deaf’ or baruganamagulkdi ‘they hanged him’. Independent noun phrases are used to identify referents, but are not grammatically necessary within clauses. Such languages typically exhibit much higher proportions of verbs to nouns (as many as 10:1) in discourse than languages like English. Not surprisingly, much information is generally carried within the verb by means of modifying affixes.

When an entity is first introduced into discourse, it is usually identified by a full independent noun phrase. In subsequent discourse, the noun phrase may be omitted, since pronominal affixes refer to the entity in question. Sometimes, however, the pronoun alone is not sufficient to qualify verbs of wide scope. Yet a separate noun phrase re-identifying the entity, now old information, would sidetrack the attention of the listener. The solution is incorporation. Incorporated nouns, not salient constituents in themselves, do not obstruct the flow of information, yet their presence is sufficient to narrow the scope of the verb, this third type of incorporation thus provides a means of backgrounding old information within discourse. In the Mundurukí sentence below, the water is first introduced by a separate noun, then, in the next clause, it is incorporated.

(2) Mundurukí (Tupi stock, Brazil, Sheffler 1978)
Ti dojot puye, o’timog ip baseya’a be.
water bring when they-water-place they basin in
‘When they brought water, they placed it in a basin.’

Compare the positions of the noun ohón’ata’ (root -hqn’at-) ‘potato’ in the Cayuga conversation below. In Cayuga, as in most of these languages, constituents are ordered according to their relative importance to the predication. New, crucial information appears early, while old or less significant information appears later.

(3) Cayuga (Iroquoian, Ontario, Henry p.c.)
A. ‘What are you going to plant this year?’
B. A: yé: akwé: onéhë’ osahe’tá’ ohqn’atá’h hni’, it-seems all corn bean potato too
‘Oh, everything, I guess, corn, beans, and potatoes too;
kwahs ɪsːoː' ə eyakwayëthwahsːp', thrëhs aːyː;
just much-ish will-we-all-plant for it-seems
we'll plant quite a lot, because it seems like
oːné toːkëhs kanːó' ohôn'aːta'.
now sure it-expensive potato
potatoes are really expensive now.'

A. Swahon'atayghwé hneː' t'ike tshikeːnhé?
you-all-potato-plant then? when-it-summer
'Did you potato-plant last summer?'

B. Thë thóːneː', thrëhs toːkëhs akastaːŋhwé'nhe'.
no there-the for sure past-it-drop-throw
'No, in fact we didn't, because it rained so much.
Aketshahn'ik aːyôhon'atáː:keh.
past-I-fear would-it-potato-rot
I was afraid they would potato-rot.'

Whether old information is represented by an incorporated noun or
simply by a pronominal prefix is determined primarily by the verb. Some
verbs, particularly those of relatively wide semantic scope, whose meaning
is significantly affected by their patients, tend to incorporate whenever pos-
sible. Others, especially those with narrower scope, never incorporate at all.
Although the primary function of the incorporated noun is to qualify the
host verb, it has a secondary effect. It retains the entity in question within
the arena of discourse.

A distinguishing feature of this third type of incorporation is its high
productivity. Since nearly any entity can become old information, a large
number of nouns are incorporated. Several facts indicate, however, that both
the creation of new incorporating forms and the manipulation of large num-
bers of such forms for stylistic purposes are relatively difficult operations.
Such incorporation is one of the last linguistic skills to be acquired by children.
(See Mithun ms.a on Mohawk.) It is one of the first to disappear in language
death. (See Mithun and Henry ms. on Cayuga, Comrie 1981:251 on Chukchi,
Weltfish 1937:vi and Parks 1976:250 on Pawnee.) The ability to use incorpo-
ration for backgrounding entities in discourse is one of the most salient dif-
fferences between especially admired speakers of incorporating languages
and average or marginal speakers. This difficulty limits to some extent the
number of such lexical items that are created and used.

As several grammarians have noted, incorporated nouns tend to be
relatively generic. Such nouns are not only more useful qualifiers, but also
fewer in number than the specific nouns they include. Osborne (1974) notes
that Tiwi, for example, another Australian language of Arnhem Land, con-
tains at least fourteen separate free nouns for types of wild honey, but only
one incorporable noun, a generic term which includes all of them. This leads
to a covert but pervasive system of nominal classification. At first mention,
an entity is identified by a full, specific noun phrase. In subsequent discourse,
a more generic noun stem is incorporated in its stead to narrow the scope
of verbs.

2. The development of overt classification

Incorporated nouns thus do not identify arguments, as their independent
counterparts do, but rather simply narrow the scope of their host verbs,
implying that a particular class of patients, instruments, or locations is
involved. Over time, this operation can develop a secondary effect: the overt
classification of nominals.

2.1. Setting the stage

Three factors set the stage for the development of a classificatory system.
The first is the qualifying function of incorporated nouns. The second is the
fact that, partly due to this qualifying function and partly due to the difficul-
ty of the process itself, only relatively generic noun stems are incorporated.
The third involves the presence of compounds containing incorporated body
parts.

It is well known that terms referring to body parts are among the most
frequently incorporated nouns. (See, for example, Sapir 1911.) This is not
surprising, since so many institutionalized activities involve them, such as
face-washing, tooth-brushing, etc. Type I compounds are frequently used to
express such activities. More importantly, speakers are normally more
interested in the effect of an event on the possessor of a body part than on
the part itself. Type II incorporation can background the body part and result
in a promotion of the possessor to a primary case role, as seen above.

Proper names are not normally incorporable in any language, nor are
nouns referring to particular human beings. They are not sufficiently clas-
sificatory to narrow the scope of verbs in a useful way. A verb like 'to
Susan-see' is unlikely to find its way into the lexicon. Most incorporating
languages, however, do have compounds like those below.
The incorporation of terms for things such as 'body' and 'mind' also set the stage for the simultaneous appearance of an incorporated classifier and an overt external noun phrase.

2.2. The appearance of overt classification

Once incorporation of the three types described above has become established in a language, the process may develop one step further. Certain verbs of wide scope occur less and less frequently by themselves, and more frequently with particular incorporated nouns. At a certain point, these well established compound lexical items begin to be used with external noun phrases which fully identify the argument implied by the qualifying noun. In the Ngandi sentence below, the incorporated noun -bun- in the compound -broi- ‘water’ + -r[- ‘eat’- ‘drink’, cooccurs with full noun phrases specifying the type of liquid consumed.

At this point, the system has become overtly classificatory. The incorporated noun signals the class (type of patient) to which the external noun phrase belongs.

As in Type III incorporation, once the argument has been identified, the incorporated noun alone is sufficient to qualify succeeding verbs. In the Cayuga text below, the stem -na'ra- ‘baked goods’ is used to qualify verbs in place of the noun phrase tekâhswa'net: ‘pie’.

In Mundurukú, the classificatory nouns are also compounded with external nouns.

As in Type III incorporation, although the primary function of an incorporated noun is to qualify the verb, it also serves to retain the entity it implies within the arena of discourse. Although it is not strictly speaking referential, and thus not anaphoric, it keeps reference clear by narrowing the scope of the verb.
2.2.1. The semantic basis of classification

Although the classification has become overt at this point, it still operates on a semantic basis, implying certain features characteristic of the referent of the noun phrase, not certain lexical features of a particular noun. The properties implied by the classifier may or may not be overtly expressed in the noun phrase, so in a sense, the classifiers may or may not be redundant in Denny's sense (this volume.) Compare the Caddo sentences below.

(9) Caddo (Caddoan, Oklahoma, Chafe p.c.)
Kapi: kančã:'ni'ah.
coffee liquid-buy-past
‘He bought (liquid) coffee.’
Kapi: dančã:ni'ah.
coffee powder-buy-past
‘He bought (ground) coffee.’

The separate noun phrase may add only deictic distinctions or some other modification of the referent. In the Caddo sentence below, the external subject is a demonstrative.

(10) Caddo
Di: tisáy'ah.
this house-be
‘This is a house’

In the Cayuga sentence below, the external noun phrase is just a number.

(11) Cayuga
Kêt niwakwiyaş'.
four so-1-children-have
‘I have four children.’

2.2.2. The question of category level

In fact, any incorporable noun, representing any category level, can be used classificatory in languages where incorporation of this type is productive. Consider the Cayuga sentence below, for example.

(12) Cayuga
Ohôn'atakë: akhôn'ata:k.
it-potato-roten past-1-potato-eat
‘I ate a rotten potato.’

The external noun phrase ohôn'atakë: is morphologically a verb. Verbs function regularly as nominals in Cayuga, but they cannot be incorporated. (It is possible to nominalize a verb by means of a suffix, then incorporate the result, but such an operation is cumbersome and done only for nomenclature entities.) Yet the verb -k ‘eat’ incorporates its patient if at all possible. This presents a conflict: the noun phrase should but cannot be incorporated. Incorporation of the noun stem alone provides a solution. Such incorporation is strictly speaking, classificatory: the set of rotten potatoes is included in the set of all potatoes. This classification is not quite the same as the prototypical classification of languages like Mandarin and Jacalteca. However, the incorporated noun represents a basic level category, and the external noun phrase, ohôn'atakë: ‘rotten potato’, a subordinate one. In the prototypical systems, classifiers are hypernyms.

Structurally equivalent constructions do express this generic (superordinate) - basic level relationship. Sentences like the Cayuga one below are common.

(13) Cayuga
So:swàis akhôn'atakë:.
dog I-domestic animal-have
‘I have a (pet) dog.

The grammatical system does not differentiate category labels according to level. This may not be an accident. The notion of level is not always as clear cut as one might hope. In some cases, the part test discussed by Tversky is revealing. In other cases, parts do not take us as far, because fewer parts are involved. For English speakers at least, it seems clear that ‘fruit’ represents a superordinate category, nouns like ‘apple’ and ‘banana’ represent basic level categories, sharing some attributes but differing in parts like the core, while ‘pippin’ and ‘delicious’ represent subordinate categories, sharing parts while differing in other ways. What about a noun like ‘meat’? It typically has few characteristic parts, and in some cases not an especially characteristic shape. Are pork, chicken, and beef basic level categories, or are they subordinate? The answer probably depends on the experience of particular speakers, context, and the nature of the instances. A person who never cooks, takes little interest in food, and routinely encounters meat in the form of a neutral colored lump, may consider ‘meat’ a basic level category. A cook looking at a picture of a roast chicken or bacon, on the other hand, would be highly unlikely to identify these simply as ‘meat’. Real world taxonomies
are not as clear cut with respect to category level as might be hoped. Incorporated classifiers thus do not obscure a distinction of level, but rather reflect an aspect of their reality.

Category level is furthermore subject to change over time. The Cayuga noun \textit{ohnyqhsa} 'cucurbit' ('squash/gourd/melon/cucumber') originally represented a basic level category. Now the category includes other categories which are obviously relatively recent, as shown by the morphologically transparency of their names and by the nature of their referents: \textit{ohnyqhsakâhie} 'watermelon' (literally 'raw cucurbit'), \textit{ohnyqhs}áqweh 'hubbard squash' (literally 'prototypical cucurbit'), \textit{ohnyqhskwâc} 'cucumber' (literally 'cucurbit covered with bumps'), and \textit{otsi}kwa: 'ohnyqhsa' 'pumpkin' (literally 'yellow cucurbit').

2.4. The development of the classifiers

All classificatory stems begin life as nouns. Some, especially those which had a generic sense to begin with, retain this sense when used as classifiers, like the Cayuga \textit{-nal}ksw- 'domestic animal', or the Muduruku \textit{-en} 'meat'.

More often, however, classifiers originate as relatively concrete nouns of narrow scope. When used as independent nominals, they retain their concrete, specific sense. When used as classifiers, they assume a more generic sense, like the Caddo \textit{tisa} 'house' — 'building', or the Cayuga \textit{-na'ta-'6read'} -r 'baked goods'. The use of the same stem to represent categories of different levels reveals an interesting aspect of this inclusion relation. Speakers do not use general classificatory nouns to classify their concrete cognates. Cayuga sentences like those below are fine.

(14) Cayuga
\begin{itemize}
  \item \textit{Skitian} \textit{ake'trehtâc'}.
  \item skidoo 1-vehicle-have
  \item 'I have a skidoo.'
\end{itemize}

Similar constructions can be used for trucks, busses, sleds, and motorcycles, but not for cars.

(15) Cayuga
\begin{itemize}
  \item *\textit{Katrehtâc} 'ake'trehtâc'
  \item car 1-vehicle-have
  \item **'I have a car.'
\end{itemize}

The stem for 'car' is the same as the classifier for vehicles, a nominalized form of the verb root '-tr- 'drag'. The external nominal \textit{katrehtâc} above is considered redundant. To tell someone that I own a car, I should say:

(16) Cayuga
\begin{itemize}
  \item \textit{Ake'trehtâc'}
  \item 1-vehicle-have
  \item 'I have a car.'
\end{itemize}

Although presumably the incorporated classifiers and their free cognates serve different functions, their combination is considered unacceptably redundant.

An interesting phenomenon occurs when the link of cognition is broken, however. Due to tabus against speaking the name of a deceased person, or even words which somehow resemble the name, many Australian languages have a particularly high level of lexical replacement. Typically, free nouns are replaced, but their bound counterparts, the constituents of compounds, may remain intact within the compounds. The results is a low match between incorporated nouns and their free semantic counterparts. Once the cognate relation between a separate noun with specific reference and a more general incorporated classifier is gone, their combination is apparently acceptable. Heath notes that the combining form of the Ngandi noun root for 'water' (and also the classifier for 'liquids') is \textit{-bun-}, while the semantically equivalent root occurring in separate nouns is \textit{ja}k. He cites the sentence below, which contains both.

(17) Ngandi
\begin{itemize}
  \item \textit{Gu-ja}k-\textit{yuq} ba-\textit{ga-bun-}pu-ni.
  \item \textit{GU-water-abs 3pl-sub-water-eat-pcon}
  \item 'and they drank water'
\end{itemize}

Oates (1964) reports that in Gunwinggu, another Australian language of Arnhem Land, the combining form of the term for 'water' (and 'liquid') is \textit{-bo:-}, while the free noun is \textit{gugga}. This combination is also acceptable.

(18) Gunwinggu (Australian, Oates 1964)
\begin{itemize}
  \item \textit{Gugu gabo-mangan}.
  \item \textit{water it-liquid-fall}
  \item 'Water is falling.'
\end{itemize}

As in other languages, equivalent roots may cooccur, provided that the free noun phrase adds information to the literal sense of the incorporated noun.
(19) Gunwinggu
\[Dabo:gun \quad gunbo:weyn.\]
I-liquid-consume GUN-water-much
'I drank much water.'

The same is true of Cayuga. The sentences below are perfectly acceptable.

(20) Cayuga
\[Ohnekaka'q \quad ekhneqha'\]
O'trehkatki' ake'trehdag'
It-liquid-delicious-infr will-I-liquid-consume
'I guess I'll have some pop.'

Over time, certain of the classifiers evolve one step further. They shift from indicating kinds of entities to qualities. Consider for example one of the more common classifiers. The stem for 'water' often becomes a classifier for all (potable) liquids. Liquids, especially potable ones, certainly constitute a generic class. They are also distinguished by a more general quality, their liquid state. At a certain point the stem comes to imply any entity in a liquid state. Such classification by quality rather than kind represents the final extension of classificatory incorporation. Concrete noun stems come to represent classes of categories distinguished by shape and/or consistency. The Caddo classifier for small round objects, -i-ah-, is also the noun stem for 'eye'. The Munduruku classifier for circular/spherical objects, a\textsuperscript{2}, is the noun 'head'. That for long, rigid, cylindrical objects, ba\textsuperscript{2}, is the noun for 'arm'. That for long, flexible cylindrical objects is bu\textsuperscript{2}, the noun for 'finger'.

The selection of a particular lexical item to represent a set of categories is an intriguing issue. Why is the noun for water usually used as the liquid classifier? Why did the Caddo 'select' the term for 'eye' instead of, say, that for 'stone', or 'plum' to represent all small round objects? Why do the Munduruku use the term for 'arm' to represent rigid, cylindrical objects, instead of that for 'leg' or 'stick'? One might be tempted to argue that the cover terms represent the prototypical members of the categories they stand for. They are characterized by the largest number of the most important criteria for group membership. It could even be argued that their own most salient properties are just these. Water, for example, is not only a more prototypical liquid than molasses or chicken soup, it also has fewer distracting non-essential properties. The choice is in fact not that purposeful, however.

Although the classifiers often do stem from nouns representing the most prototypical members of the categories they imply, their selection is actually a function of the lexical status of incorporating constructions. Once coined, compounds are learned as lexical units by speakers and used as such, not created a new each time they are used. Terms for entities that appear especially frequently in speakers' experience, in a variety of contexts, are likely to appear in the largest number of frequently used lexical compounds. It is these compounds that serve as the model for the establishment of classifiers. In most cultures, water appears more frequently, in more contexts than molasses. The noun for water is thus a constituent of more, frequently used compounds. It is not surprising that this term should become the liquid classifier. The use of terms for body parts as classifiers in Caddo and especially in Munduruku has the same explanation. Such terms are among the most frequently incorporated nouns.

Does the choice of particular terms to serve as classifiers affect the ideas concerning prototypicality of subsequent generations of speakers? Apparently not. The Mohawk classifier for 'fruit' is -ah-, also the term for 'berry'. This might seem strange, since all Mohawks consume many more apples, oranges, and bananas, than berries of any kind. The reason for the choice of this term is clear: the classifier was established long before Mohawks had come into contact with apples, oranges, and bananas. When asked to give a list of fruits in Mohawk, modern speakers invariably begin with sewahy6:wane 'apple'. The order of the fruits which follow varies somewhat from speaker to speaker, and appears to be determined partly by frequency of appearances and partly by the complexity of the Mohawk term, but the term for 'berry', kahi, appears very late, if at all. Specific terms for 'strawberry' and 'blackberry' (literally 'long kahi') generally appear after those for 'apple', 'banana', 'cherry', 'grape', etc. The use of a noun as a classifier does not even prevent the noun from shifting semantically when used as a free noun phrase. The liquid classifier -heh- of the Northern Iroquoian languages has assumed a specialized meaning of 'whiskey/liquor' when used as a free noun phrase. The liquid classifier -heh- of the Northern Iroquoian languages has assumed a specialized meaning of 'whiskey/liquor' when used as a free noun phrase. The liquid classifier -heh- of the Northern Iroquoian languages has assumed a specialized meaning of 'whiskey/liquor' when used as a free noun phrase. The liquid classifier -heh- of the Northern Iroquoian languages has assumed a specialized meaning of 'whiskey/liquor' when used as a free noun phrase. The liquid classifier -heh- of the Northern Iroquoian languages has assumed a specialized meaning of 'whiskey/liquor' when used as a free noun phrase.
3. **Solidification of the System**

All incorporation discussed up to this point involves productive lexical rules. As noted above, however, it can be a relatively difficult operation to perform, and is correspondingly fragile. Its evolution may cease at any point. When the process loses its productivity, speakers simply stop inventing new noun-verb combinations, although they continue to use those already in the lexicon. Over time, normal processes of linguistic change obscure the internal structure of the compounds. Phonological changes blur morpheme boundaries. Semantic changes skew the semantic relationships between the bound constituents and their free cognates. Lexical replacement may eliminate the free cognates from the lexicon altogether. The result is an ever diminishing pool of increasingly opaque relic compounds. When the lexical rules lose their productivity, the set of incorporated classifiers simply becomes closed. The existing classifiers continue to function, however, even after they have lost their formal transparency. Speaker continue to use the once complex verb stems appropriately, even with respect to new nominals in the language.

An example of a system at this stage can be found in Cherokee, spoken in North Carolina and Oklahoma. Relic forms remain of all types of incorporation. Among these are sets of verb stems (King 1976 counts 30) whose selection is determined by specific properties of their patients, like those below.

(21) Cherokee

<table>
<thead>
<tr>
<th>Verb Stem</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>gakaneha</td>
<td>‘he’s giving him a living thing’</td>
</tr>
<tr>
<td>ganehneha</td>
<td>‘he’s giving him some liquid’</td>
</tr>
<tr>
<td>adeha</td>
<td>‘he’s giving him a long, rigid object’</td>
</tr>
<tr>
<td>ganvneha</td>
<td>‘he’s giving him a flexible object’</td>
</tr>
<tr>
<td>ahneha</td>
<td>‘he’s giving it to him’ (something not contained in one of the above categories)</td>
</tr>
</tbody>
</table>

They are used as follows.

(22) **Cherokee**

<table>
<thead>
<tr>
<th>Verb Stem</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>lej</td>
<td>new pencil</td>
</tr>
<tr>
<td>digohwelodi udelv didehlohngasgi.</td>
<td>he/him-long, rigid/gave student</td>
</tr>
<tr>
<td>‘He gave the student a new pencil.’</td>
<td></td>
</tr>
</tbody>
</table>

The verbs may be either transitive, as above, or intransitive. A high proportion of the alternating sets describe the position and/or manipulation of objects, such as ‘lay’, ‘be in water’, ‘be on a raised surface’, or ‘handle’, ‘carry’, ‘pick up’, ‘push aside’, etc. This is typical of such systems, and not at all surprising, since the shape and consistency of the patient involved significantly affects the state or action predicated. Not all verbs have all five forms, since not all combinations are pragmatically compatible, such as ‘liquid’ + ‘place in a row’, or ‘animate’ + ‘cut off’.

The alternate stems differ in form in suggestive but not perfectly systematic ways. Their clearly learned as separate lexical items by speakers. Certain recurring segments betray their origin, however. A number of verbs implying liquid patients begin with the sequence -ne-. Although this is not cognate to the Cherokee noun for water, which is ama, it is clearly cognate to the Northern Iroquoian noun stem -hnek- ‘water’, also used as the liquid classifier. Others are more erratic, such as an initial -n- or -v- in a number of verbs implying flexible patients and an initial -t- or -y- in many verbs implying long and rigid patients. Assignment of ancestral forms to these segments would be speculative at best. The neutral stems, those used when the patient belongs to none of the other categories, are typically the shortest forms, presumably descended from verbs with no incorporated nouns.

Although the classifiers are no longer formally transparent, cooccurrence restrictions between the once complex verbs and separate nominals remain semantic rather than becoming arbitrarily lexical. King points out, for example, that the animate form of verbs is used with live animals, but the flexible form is used for dead ones. Thread by itself is considered flexible, but on a spool it is in the neutral category. He notes that a very few items are classified in seemingly unexpected ways. The terms for ‘hammer’ and ‘ax’, are classified as neutral, although a non-speaker might expect them to be viewed as long and rigid. For the most part, however, the old classifiers continue to function semantically, even with new lexical items.

4. **Conclusion**

The classificatory systems which evolve from noun incorporation thus share the fundamental characteristics of the more familiar systems in which classifiers are separate words. One of the most striking similarities involves the repertoires of classifiers found in various languages. They may represent primarily kinds of entities, as in Cayuga and Ngandi, they may include a mixture of kinds and qualities, as in Mundurukú and Caddo, or they may consist almost entirely of qualities, as in Cherokee. This array is the result of the normal evolution of classificatory incorporation, but it mirrors the arrays found in prototypical systems, such as the Mandarin (Erbaugh), Jacal-
At first, speakers begin by incorporating generic terms for the categories they wish to recognize, those which will qualify verbs in useful ways. Animate/inanimate, concrete/abstract, or human/animal distinctions arise in this way, as through the Cayuga classifiers -ya't- 'body', -nik'ghar- 'mind', -rih,w- 'matter, idea, fact, etc.' and -nahskw- 'domestic animal'.

As times goes by, some of the incorporable classifiers become in a sense even more generic, implying only general qualities, rather than kinds of entities. The result is a mixed system with some terms classifying by kind, others by quality. Mundurukú has such a system. It includes generic terms such as road, name, village, and kin, alongside of qualifying terms such as 'round objects', 'long, rigid objects', 'long, flexible objects', and 'liquids', etc. Caddo, further along in such evolution, contains correspondingly more classifiers for qualities. Along with such classifiers as 'building' and 'dirt' are even more generic terms, such as 'wooden objects', and finally, those which denote such qualities as 'liquid', 'granular substance', and 'small, round objects'. The lexical process of incorporating new noun stems for classificatory purposes is just barely still productive in the language. Speakers can try new ones out and discuss their merits, but they are quite aware that they are being highly innovative.

With the development of ever more generic classifiers, the classification can become more systematic. More objects qualify as either liquid, rigid, flexible, or animate, for example, than as kinds of baskets, meats, or clothing. Fewer entities are unclassifiable. When incorporation loses its productivity, furthermore, the set of classifiers is no longer open. New classifiers reflecting kinds of entities are no longer added to the system, and those that remain are presumably used less frequently than the quality classifiers. The result is a tighter but simpler system of classification, as in Cherokee, where entities are simply classified as animate, liquid, long and rigid, flexible, or none of these. This set of distinctions is strikingly like that found in a number of prototypical classifier systems, a set particularly useful for qualifying predicates.

The use of large sets of classifiers, in both prototypical systems and those based on incorporation, can be relatively difficult process. Erbaugh notes that children acquiring Mandarin generally use classifiers somewhat less than adults, just as those learning Mohawk incorporate considerably less than adults. Becker, commenting on Burmese, and Delancy, on Thai, both remarked that adults vary widely in their skill and virtuosity in the use of classifiers. As with incorporation, admired speakers tend to use larger sets more frequently, when there is a choice, than more ordinary or more marginal speakers.

A common function attributed to the prototypical classifiers is an anaphoric one. (For a detailed discussion of such anaphora, see Downing, this volume.) They function in place of, or in conjunction with, pronouns. While incorporated nouns are not strictly speaking referential, and thus cannot be literally anaphoric, they do serve to retain an entity within the arena of discourse. They substitute for an external nominal in appropriately qualifying their host verbs, once the entity in question has been appropriately identified by some other linguistic or pragmatic means.

Incorporated classifiers arise from a very different source historically than the prototypical free ones. Incorporation is a construction whose primary function is to qualify verbs rather than nouns. Note, however, that Denny proposes (this volume) that a fundamental function of classifiers is to qualify verbs, setting up expectation concerning the scope of the verbs. The two types of classifiers are, in fact, similar in being derived from nouns whose categorial status as nouns has been significantly reduced, in the sense of Hopper and Thompson (1984). The fact that classificatory incorporation and free classifier systems are so similar is no accident. The predication of events and states is a basic function of language. The modification of these predications in terms of the classes of entities they involve permits speakers to deal with large quantities of information in efficient ways.

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