Lexical categories

Words may be grouped into categories based on their shared grammatical behavior.

How can we tell which category a particular word belongs to?

There are three main criteria:

- meaning (but there is semantic overlap among categories)
- morphological inflection (only applies to some categories and can be irregular)
- distribution (applies to all categories but there is typically variation among words within each class)
Criteria for identifying categories: meaning

Meaning is used in many traditional grammars to define the lexical categories.

A **noun** is a word that denotes a person, place, thing, or animal: *horse, actor, kitchen sink, Hawaii, uncle…*

A **verb** is a word that denotes an action: *run, jump, hit, talk, drop, eat…*

An **adjective** is a word that denotes a property of something or someone: *cold, tall, helpful, miserable, silly, ripe…*

A **preposition** is a word that denotes a location or spatial relation: *on, in, under, above, below*
Criteria for identifying categories: meaning

Although the lexical categories are *typically* associated with these meanings, the criterion of meaning does not uniquely define a category.

- *destruction* is a noun, but it denotes an action, not a thing (similar to the verb *destroy*).
- *know* is a verb, but it denotes a state of mind rather than an action (similar to the noun *knowledge* and the adjective *knowledgeable*).
- *former* is an adjective, but it is not a property of anything.
- *of* is a preposition, but it does not denote a location or spatial relation.
Criteria for identifying categories: inflections

The shape of the word sometimes indicates its lexical category. In English, nouns, verbs, and adjectives may be recognized by the fact that they can take certain inflections.

Only nouns may take plural marking: boys, results
Only verbs may take tense marking: walked, announced, arrived, talked, solved, cried, rained
Only adjectives may take comparative and superlative forms: bigger, biggest, angrier, angriest
Criteria for identifying categories: inflections

However, morphological properties are often irregular and lexically idiosyncratic.

Some verbs cannot take the past tense ending -ed:
*He putted the book on the table.

A subclass of nouns (mass nouns) cannot take any plural ending:
*There are three furnitures in the bedroom.
*I gave him several advices.

Certain adjectives cannot occur in comparative and superlative forms:
beautiful, *beautifuler, *beautifulest
elegant, *eleganter, *elegantest
Criteria for identifying categories: distribution

The **distribution** of a word is the positions in which a word may occur in a phrase or sentence.

**Distribution of English adjectives:**

Only adjectives can come in between a degree word and a noun:

- a *very* large pumpkin, a *really* good book

Nouns and verbs cannot occur in this position:

- *a very* greatness pumpkin, *a really* read book

Only adjectives can occur without other words in predicate position following copular *be*.

- This pumpkin is *large*. / *This pumpkin is bargain.*

Only adjectives can occur in *as—as contexts:*

- *as* expensive *as* / *as* bargain *as*
Criteria for identifying categories: distribution

However, some English adjectives are restricted in their distribution:

- the *tall* boy
- the boy is *tall*
- very *tall*
- as *tall* as me

- *the asleep* boy
- the boy is *asleep*
- ?very *asleep*
- ?as *asleep* as me

- the *total* stranger
- *the stranger is total*
- *very total*
- *as total as me

Are any properties distinctive of all adjectives in English, and not shared with other categories such as adverb?

Is it sufficient to relegate the differences in distribution to subcategories of adjective?
Criteria for identifying categories: summary

• Categories have typical meanings associated with them, but meaning is not a very reliable criterion for identifying the category of an item.

• Inflection is often useful for identifying categories, but only when it is overtly manifested.

• Distribution can be used with any word in any language, but there is typically a good deal of variation among members of the same word class.

• To deal with this variation, we may recognize subcategories of words, such as transitive verbs, gradable adjectives, mass nouns, and proper nouns.

• But, how do we tell the difference between a category and a subcategory? How do we deal with overlap between two categories or subcategories?
Major approaches to categories

**Traditional Grammar**

Mixing of different criteria—semantic, morphological, syntactic.

Attempting to impose the categories of Greek and Latin onto other languages.

No necessary and sufficient conditions for category membership, just general characterizations pertaining to the prototypical members.

*rhema* (‘verb’) -- ‘a part of speech without case inflection, but inflected for tense, person and number, signifying an action performed or undergone’ (Dionysius Thrax, second century, B.C.)
Major approaches to categories

**American Structuralism** – Edward Sapir, Leonard Bloomfield, Zellig Harris

More empirical rigor. Distributional (morphological and syntactic) criteria but not semantic criteria are used to define categories.

Recognition that category systems differ from language to language, and that distributional and inflectional properties of categories overlap with each other within any given language.

No real solution offered.
Major approaches to categories

**Generative Syntax**

Abstract universal syntactic features are used to define categories. (Chomsky 1965, 1970, 1981)

Less emphasis on distribution. Distributional facts are assumed to be derived from feature specifications.

Cross-linguistic differences assumed to result from slightly different combinations of features for different languages.

Variation within categories, to the extent that it is acknowledged at all, is shown by different combinations of category and subcategory features.

In the 1990’s, several functional heads are added to the inventory of universal categories (determiner, complementizer, auxiliary)
Major approaches to categories

Generative Syntax

Chomsky (1965) *Aspects of the theory of syntax* argues that categories and subcategories should be represented in terms of lexical features, where each feature has a + or – value. In cases where the word can have either + or –, the symbol ± is used.

*explanation:* [+N, +common, +count, ±plural]

*advice:* [+N, +common, -count, -plural]

*scissors:* [+N, +common, -count, +plural]

*Mary:* [+N, -common, -plural]

*absent:* [+A, -gradable]

*small:* [+A, +gradable]
Major approaches to categories

**Generative Syntax**

In later work, Chomsky proposes a set of **cross-categorial features**:

<table>
<thead>
<tr>
<th>Category</th>
<th>Feature</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verb</td>
<td>[+V –N]</td>
<td>Adjective</td>
</tr>
<tr>
<td>Noun</td>
<td>[–V +N]</td>
<td>Preposition</td>
</tr>
</tbody>
</table>

(Chomsky 1981: 48)

This implies that lexical categories form natural classes.

For example, verbs and adjectives are [+V].
- In Japanese, verbs and adjectives are inflected for tense, but nouns and prepositions are not.

Similarly, verbs and prepositions are both [-N].
- In English, verbs and prepositions can take a DP complement and assign Case, but nouns and adjectives cannot.
4. Functionalist Typology

Follows up on Structuralist tradition of defining categories of languages in their own terms, according to strict distributional criteria.

Cross-linguistic category labels are not defined in terms of universal features, but instead used as metalinguistic labels based on functional similarity (e.g., class of words that typically names persons, animals, and objects and used for reference is called ‘noun’)

Distinction between categories and subcategories is unclear and arbitrary

Cross-linguistic tendencies are captured by semantic-pragmatic prototypes, markedness principles, and implicational universals
Language-specific approach to categories is generally assumed (similar to functionalist approaches, and distinct from mainstream generative approaches)

Often categories are simply listed as [+N], [+V], etc. with no further explanation.

Variation among category members is dealt with in terms of one or more of the following:
- 1. subcategories (e.g., common noun, proper noun)
- 2. other lexical features (valence, grammatical function, semantic and pragmatic features)
- 3. constructions that admit unusual word classes with idiosyncractic form-meaning combination
- 4. mixed categories that inherit properties from more than one general category
English quantificational nouns (QNs)

Quantificational nouns: **bunch, lot, heap, load, ton**

Polysemous in modern-day English. Sometimes ambiguous between collective or partitive meanings and purely quantificational meanings.

She gave me a bunch of bananas.

We have tons of salad left over.

Syntactic properties of English QNs  
(Francis & Yuasa 2008)

QNs occur in the typical **head noun position** of a binominal NP, may occur with determiners, adjectives (rather than adverbs), plural marking, coordination with ‘and’, PP complements

a. I know a lot of people who may watch the TV news in the evening but don't spend the time to actually read a newspaper. (Switchboard Corpus)

b. And there were a bunch of kids, you know, and a bunch of schools. (Switchboard Corpus)

c. I guess, uh, Barry Manilow comes to mind for some reason there’s, there’s not a whole lot of his stuff that I 'm real crazy about, but he does have some things. (Switchboard Corpus)

d. Nobody knows about it, but, you know, ends up costing the company lots and lots of money. (Switchboard Corpus)
Semantic change of English QNs (Francis & Yuasa 2008)

“bundle” sense – items connected together

a. On his craven crest, *A bunch of heares* discolourd diversly. (1590, OED)
b. And for thy bed tak now *ane bunche of stro*. (1593, CMEPV)

Collective sense – items grouped together, but not necessary connected

See what persons God hath picked out of *all the bunch of the Patriarches, Prophets, Judges, and Kings*. (OED, 1622)

OED = Oxford English Dictionary online; CMEPV = Corpus of Middle English Prose and Verse
Semantic change of English QNs  (Francis & Yuasa 2008)

**quantity sense – large number or amount**  (many, much)

a.  Yeah, well, down by Lake Texoma there's a bunch of wooded area.  (Switchboard Corpus)

b....went through and interviewed a bunch of jurors in some of the big cases, and in many cases looking at what had, at the evidence afterwards as to whether the decision was right, went back to the jurors, uh, based on the deliberations.  (Switchboard Corpus)

**Semantic extensions of bunch** (quantity sense arises by metonymy):

  bundle (attachment) > collection (grouping) > large quantity

**Change in semantic function:**

  Semantic head of nominal expression  > Semantic modifier of common noun
Semantic constraints on English QNs (Francis & Yuasa 2008)

Unlike N1 of a collective NP, QNs are non-referential and are not semantic heads

- QNs don’t control subject-verb agreement:  *a lot of schools is closing*
- cannot themselves be counted or quantified:  *two lots of schools*
- modified by a limited range of adjectives:  *a whole lot of books / an expensive lot of books*
- can only occur with the semantically bleached determiner *a/an* or bare plural:
  *those bunches of schools / the lots of oranges*

Similar constraints apply to ordinary quantifiers:

- *two many schools*  
  very few books  
- *some much advice*  
  *expensively few books*  
- *many schools is closing*
English QNs: a multi-modular analysis

- QNs have undergone semantic change from head of nominal expression to quantifier.
- The syntactic category and position within the noun phrase have been retained from the source construction.
- The determiner *a* and the preposition *of* contribute no semantic content but satisfy syntactic requirements of NP construction.
- The syntactic and semantic properties of QNs are specified in their lexical entries.
- The notation from our multi-modular analysis could easily be translated to Berkeley Construction Grammar or other constructionist frameworks.

Diagram from Yuasa & Francis (2003)
English Binominal NPs (Kim & Sells 2015)

(1) (a) It’s been [a hell of a day] at the office.
(b) And it introduced her to Budapest[, a jewel of a city].
(c) And you won’t be saying anything to [that ponce of a boss] you’ve got, Howard?
(d) Rune nodded [his shaven dome of a head].
(e) She had [a skullcracker of a headache].
(f) A door opened; and into the assessment room stepped [a giant of a man].

The preposition *of* is obligatory. Consider the following naturally occurring data:

(6) (a) I had a hell *(of)* a time on this tour.
   (b) And it introduced her to Budapest, a jewel *(of)* a city.
   (c) I don’t think it will be too bad a dose, but it’s a beast *(of)* a complaint.

The second determiner must be *a/an.*

(11) (a) a hell of a/*some/*any/*one day
    (b) this slip of a/her/*that/*this/*some/*any/*the/*one girl
English Binominal NPs (Kim & Sells 2015)

The first determiner can take various forms.

(7) (a) He is [a hulk of a man] in his middle fifties.
    (b) [Some dragon of a receptionist] refused to let him see her boss without an appointment.
    (c) This situation would be [one humdinger of a funny story] to tell his city friends over a drink or two.

(8) (a) [The ghost of a smile] glimmered in his eyes.
    (b) I suspect she’d been following [that fool of a carrier].
    (c) She was to marry this mountebank[, this hypocritical toad of a Sir Thomas].
    (d) And she was old, antique. Deep lines grooved [her prune of a face].
English Binominal NPs (Kim & Sells 2015)

Unlike QNs, which can’t be semantic heads, N1 of Binominal NP appears to have some referential function, which is shared with N2.

(14) (a) We should have fired

\[
\begin{aligned}
\text{that plonker of a plumber.} \\
\text{that plonker.} \\
\text{a plumber.}
\end{aligned}
\]

(b) She doesn’t want to talk to

\[
\begin{aligned}
\text{this idiot of a prime minister.} \\
\text{this idiot.} \\
\text{a prime minister.}
\end{aligned}
\]
English Binominal NPs (Kim & Sells 2015)

However, NP1 can’t be the antecedent to a pronoun:

(a) He’s [an absolute gem of a person]. He/*the gem/*it became the youngest scoring champion in league history.

(b) The hostler is a tree of a man, with wrists as thick as my leg, and he/*the tree/*it can be trusted.
English Binominal NPs (Kim & Sells 2015)

Similar to NPs with attributive adjectives, binominal NPs can be paraphrased with N1 as predicate nominal.

(19) (a) He had been sitting quietly in [his hovel of a home].
    (b) You are old enough to get your own food, like [your fool of a father].
    (c) The boy knelt down by [Philip’s wreck of a trap].

(20) (a) His home is a hovel.
    (b) Your father is a fool.
    (c) Philip’s trap is a wreck.

Compare: his small home / his home is small / his foolish father / his father is foolish
English Binominal NPs  (Kim & Sells 2015)

The entire binominal NP can be focused in a cleft construction but parts of it cannot. Nor can the PP be extraposed. This suggests a non-standard constituent structure.

(29) (a) She had [a skullcracker of a headache].
    (b) It was [a skullcracker of a headache] that she had __.
    (c) *It was a headache that she had a skullcracker of __.
    (d) *It was of a headache that she had a skullcracker __.

(34) (a) A monster of a machine was delivered.
    (b) *A monster was delivered [of a machine].
English Binominal NPs (Kim & Sells 2015)

Two of the analyses from previous proposals

![Diagram of two trees showing binominal NPs]

Note the similarity to our multi-modular analysis of QNs. The first tree looks like the syntax and the second tree looks like the semantics.
Kim & Sells propose a constructional analysis with non-standard syntax (juxtaposition construction) and special semantics in which N1 denotes an evaluative property of N2.

Question: how does this approach differ from the multi-modular analysis presented for English QNs?
English verbal gerunds (Malouf 2000, 2006)

What category do verbal gerunds resemble in these examples?

(3) a. I believe that Pat’s/Pat taking a leave of absence bothers you.
   b. Why does Pat’s/Pat taking a leave of absence bother you?
   c. It’s Pat’s/Pat taking a leave of absence that bothers you.

(4) a. *I believe that Pat took a leave of absence bothers you.
   b. *Why does that Pat took a leave of absence bother you?
   c. *It’s that Pat took a leave of absence that bothers you.

English verbal gerunds (Malouf 2000, 2006)

What category do verbal gerunds resemble in these examples?

(9) a. (Pat’s/Pat) calling *(of) the roll started each day.
   b. The calling *(of) the roll started each day.

(10) a. Pat disapproved of *(me/my) quietly leaving before anyone noticed.
     b. The careful/*carefully restoration of the painting took six months.

(11) a. Pat’s not having bathed for a week disturbed the other diners.
     b. *The not processing of the election results created a scandal.
English verbal gerunds (Malouf 2000, 2006)

Summary

(10) a. Pat disapproved of (me/my) quietly leaving before anyone noticed.
    b. The careful/*carefully restoration of the painting took six months.

(17) a. A VGer takes the same complements as the verb from which it is derived.
    b. VGers are modified by adverbs and not by adjectives.
    c. The entire VGerP has the external distribution of an NP.
    d. The subject of the gerund is optional and, if present, can be either a genitive or an accusative NP.
English verbal gerunds  (Malouf 2000, 2006)

Pullum’s (1991) analysis of English verbal gerunds

(35)  
```
NP
   /
/    
NP[POSS+] VP
   /    
Brown’s V NP
    /     
painting his daughter
```  

(38)  
```
S
 /   
NP VP
 /     
Brown V NP
   /     
painting his daughter
```
English verbal gerunds (Malouf 2000, 2006)

Malouf’s construction-based analysis

The main idea is that categories consist of different independent levels of linguistic information. In Malouf’s theory, lexical heads are specified for the following syntactic information:

1. categorial information, following standard X-bar theory, determines the external distribution of the phrase

2. selectional information determines what kinds of complements a head can combine with

3. constructional information determines what kinds of other phrases can occur with the head
English verbal gerunds (Malouf 2000, 2006)

Malouf’s construction-based analysis

Gerund is a subtype of the category noun, sharing the categorial properties of nouns and giving gerund phrases the external distribution of NPs.

However, since gerunds are not common nouns, they cannot be modified by adjectives.

Gerund is cross-classified as a subtype of category verbal, which also includes verbs and adjectives. This allows them to take adverbial modification.
Malouf’s construction-based HPSG analysis

Gerunds are derived from present participle verb forms by a lexical rule.

Gerunds share the morphological, selectional, and constructional properties of their corresponding verbs. This gives them the internal structure of a VP.

Gerunds differ from participial verbs in selecting for both a subject and a specifier, which are identified with each other by an index.
English verbal gerunds (Malouf 2000, 2006)

Malouf’s construction-based HPSG analysis

Figure 2. Pat’s folding the napkins.
The analysis avoids some of the problems of other approaches because phrases are headed in the normal way, with head and mother node of the same category, gerund. What changes is the conception of what a category is.

The occurrence of mixed categories is constrained by a condition on lexical entries that limits what kinds of mixed lexical properties are possible.

Malouf’s approach is claimed to be compatible with functional notions of category, but stated in formal terms.
English verbal gerunds (Malouf 2000, 2006)

Malouf’s construction-based analysis

How does Malouf’s cross-classification of head features differ from Chomsky’s cross-categorial features?

Verb:          [+V –N]  Adjective:  [+V +N]
Noun:          [–V +N]  Preposition:  [–V -N]

How does Malouf’s analysis modify the usual conception of categories and subcategories?

Where do Yuasa & Francis (2008), Kim & Sells (2015), and Malouf (2000) locate the idiosyncrasies of the constructions that they analyze?
Summary: advantages of a constructionist approach to categories

Language-specific approach to categories avoids empirical problem of defining universal categories.

Variation among category members is captured by combining different types of morphological, syntactic, semantic, and pragmatic, information together into lexical and/or phrasal constructions:

- The theoretical approach provides many different types of syntactic and semantic features, in addition to so-called category features such as [+N]
- Words can be specified with unusual combinations of syntactic and semantic properties (English QNs)
- Special constructions can capture unusual phrase structure properties and/or idiosyncratic semantic properties (English binominal NPs)
- Multiple inheritance relations can be used to motivate mixed categories that resemble more than one general category (English verbal gerunds)