Linguistics 210
Introduction to Linguistic Analysis
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Part 2

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Linguistics 210

Coursepack Part 2

Contents

- Syntax Topics ........................................................................ 1-4
- Problems: Malay (Indonesian) .............................................. 5-7
- Problem: Acehnese ‘Passive’ .............................................. 8
- Problem: German cases ...................................................... 9
- Problem: Basque relative clauses ..................................... 10
- Problem: English wh- Questions ..................................... 11
- Ergativity .............................................................................. 12
- Problem: PiJantjara ............................................................ 13-15
- Logical and Syntactic Tree Structures ......................... 16-18
- Syntax Quiz Study Sheet .................................................. 19
- Logic Study Guide .............................................................. 20-34
- Types of Predicates .............................................................. 35
- Verb Phrase Study Guide ................................................ 36-44
- Problems: English Verb Phrase and Reflexives .......... 45
- Equi-NP-Deletion vs Subject-Raising ............................ 46
- The Cliff’s on Equi and Raising ....................................... 47-51
- Tests for Equi and Raising ................................................. 52
- Problem: English Object Complements ....................... 53-54
- Problem: English Subject Complements ...................... 55-56
- Problem: English Wh-Structures .................................. 57
- Problem: English Garden Path Sentences .................... 58
- Problem: English Tag Questions .................................... 59
- Problem: English Phrasal Verbs ..................................... 60
- Problem: English Noun Phrases ..................................... 61
- Problem: English Dative Structures ............................... 62
- Problem: English Relative Clauses ............................... 63
- Funny NPs ........................................................................... 64
- Levin Verb Classes: Spray/Load Verbs and Fill Verbs .... 65
- ‘Triggers’ for Presupposition and Entailment ............... 66-67
- English Irregular Verbs .................................................... 68-69
- Adverbial Subordinating Conjunctions and Conjunction Phrases ................................................................ 70
- Problem: ‘Verbing’ ............................................................... 71
- Negatives and Negative Polarity Items ......................... 72
- Problem: NPI Squish ............................................................ 73
- Problem: Negative-Raising ............................................... 74
- Metaphor article ................................................................. 75-77
- Problem: Metaphor ............................................................... 78-80
- Problem: The Conduit Metaphor .................................... 81
- Problem: Grice’s Maxims .................................................. 81a
- An Ontology for English Verbs of Cutting ................. 82
- Phonosemantic Coherence in English Assonances .......... 83
- The Br Assonance in English ......................................... 84-85
- The Pr Assonance in English ......................................... 86
- The BL Assonance in English ......................................... 87
- Phonosemantic Coherence in English Rimes .............. 88-94
- Body Ritual article ............................................................. 95-97
Syntax Topics

1. Syntax and morphology are the two parts of grammar.
   - Morphology deals with the internal economy of the word.
   - Syntax deals with the external economy of the word.

2. Words are constituents of larger groups, called phrases, which may aggregate into
   larger phrases, and eventually into a different kind of constituent, called a clause.

3. The difference between a phrase and a clause is that a phrase is focussed on one
   kind of word: a noun phrase (NP) is an elaboration of a noun, a verb phrase (VP)
   of a verb, etc; while a clause is a relation between two kinds of phrase: VP (Predicate)
   and NPs (Argument(s) of the Predicate).

4. Every sentence has at least one clause; many have more. If there are several, only
   one can be the main clause; the rest are subordinate clauses of one kind or another.

5. Grammatical functions expressed in many languages (called synthetic languages)
   by morphological inflection (e.g., tense, mood, voice, etc.) are expressed in English
   (an analytic language) by various syntactic constructions and augmentations, often
   using sets of special words called auxiliaries, particles, or function words. Such
   words include prepositions, conjunctions, quantifiers, and articles; sets of them are
   called closed classes, because they are small and don’t borrow new words.

6. The most important kind of word in any sentence is the matrix predicate, which in
   English can be a predicate adjective or predicate noun (with a form of be in front
   of it to receive the tense). The matrix predicate governs the type and existence of
   any subject, object, complement, or inflection appearing with it.

7. There are a number of different kinds of sentence. Each has its own kind of syntactic
   structure and peculiarities; but each can be related systematically to the others
   by syntactic rules.
   - Statements, called declaratives.
   - Questions, called interrogatives
   - Orders, called imperatives

8. Two special rules of English apply to all that follows:
   - If there is no auxiliary verb and you need one, use do. (do-Support)
   - All forms of be are always considered to be auxiliaries.]

9. There are several kinds of questions:
   - Yes/No questions, which expect an answer of yes or no, are formed from state-
     ments by the rule of Subject-Verb Inversion, which moves the first auxiliary to
     the beginning of the sentence.
Syntactic Topics

- **WH-questions**, which expect an answer with specific information, are formed from statements by the following rules (in order):
  1) substitute the proper WH-word for the NP being questioned, and
  2) if the WH-word is not already at the beginning of the sentence,
     a) form a Yes/No question (see above), and
     b) move the WH-word to the beginning of it. (WH-Shift)
- **Tag questions**, which are added at the end of statements, reprise the grammatical structure of the statement in the following way:
  1) Copy the first auxiliary to the end of the statement;
  2) If the statement is affirmative, negate the copied auxiliary (using a canonical contraction if possible); and vice versa;
  3) Add a pronoun that's coreferential to the subject of the statement after the (possibly negative) auxiliary.

10. Subordinate clauses must function like some kind of word in a clause; i.e., there are Adjective, Noun, or Adverb clauses.

11. There are several different kinds of rules that produce all these structures:
    - *insertion* rules
    - *deletion* rules
    - *movement* rules

12. There are structural *constraints* on movement rules. Some structures, called *islands*, impose boundaries to extraction rules like *Relative-Clause Formation* and *Question-Formation*.

13. **Adjective clauses** are of two kinds:
    - *Relative clauses* function as adjectives, must be part of an NP, and must contain a NP that is co-referential with the NP they modify. A relative pronoun is substituted for this in the relative clause, and moved to the beginning of the clause, if it's not there already.
    - *NP complement* clauses also function as adjectives, and must be part of a NP, but they don’t contain a coreferential NP, and the noun they modify must be a *picture noun*, like *story, report, or picture*, that refers to some conceptual entity with a content that can be expressed by a complement clause.

14. **Adverb clauses**, like adverbs, may appear in many different places in a sentence, but (also like adverbs), may modify either the verb or the entire sentence. They are generally marked at the beginning with a *subordinating conjunction*, like a preposition for a clause, that indicates the kind, degree, and special nature of their relation to the rest of the clause. Some examples of subordinating conjunctions are *because, before, after, if, since, although, while, when, whenever, as soon as*, and *until*. There are lots more.
15. **Noun clauses** are called **Complements**, and must be the subject or object of some **matrix predicate**; which governs such things as whether it can be a subject or an object, and which of the three **complementizers** (constructions that mark the beginning of complements in English as being subordinate) can be used with it:

- **for...to**, the **infinitive** complementizer;
- **POSS...-ing**, the **gerund** complementizer;
- **that S**, the **finite** (i.e., inflected) **clause** complementizer.

Each of these can function as subject or as object, and in addition, it’s possible to form a fourth type of complement that doesn’t actually use a complementizer:

- **Embedded questions**.

16. Subject Complements do not occur often as subjects in English, because English prefers the first verb early in the sentence; if possible, the second constituent (i.e., word or short phrase) in the sentence. A variety of rules conspire to produce English sentences with this structure:

- **Extraposition** is a rule which moves subject complements to the end of the sentence, leaving a dummy *it* pronoun behind to hold the subject position. Extraposition is governed by the matrix predicate.

- **Subject-Raising** (Raising for short) is a rule which replaces an infinitive complement with just the subject of that complement, moving the remainder of the infinitive to the end of the sentence. Raising may occur with either subject or object complements; it raises the subject of the complement clause, but the Raised NP of a Subject Complement becomes the Subject of the matrix clause, while Raised NP of an Object Complement becomes the new Object of the matrix clause. In either case, Raising is governed by the matrix predicate.

- **Tough-Movement** is a rule which replaces an infinitive subject complement with just the object of that complement, moving the remainder of the infinitive to the end of the sentence. Tough-Movement is governed by the matrix predicate.

- Several types of **Subject-Verb Inversion** (like the process that occurs in Yes/No Questions) occur when modificational phrases like adverbs (especially negative ones like *never*) occur at the beginning of the sentence. Subject-Verb Inversion is usually governed by the adverb being preposed.

17. **Equivalent Noun Phrase Deletion** (**Equi-NP Deletion**, or just **Equi** for short) is a rule which deletes the subject of a non-finite object complement (infinitive or gerund) under coreference with a noun in the matrix clause (either the Subject, in simple transitive matrix clauses, or the [Indirect] Object in ditransitive matrix clauses). Sentences with Equi resemble those with Raising; and like Raising, Equi is governed by the matrix predicate. It is easy to confuse Equi with Raising, since they produce similar structures; but they work with different predicates and produce different kinds of sentence.
18. The internal structure of the VP is notably more complex than that of the NP. Besides the possibility of multiply embedded VP's with auxiliary verbs, and of object complements, there are also phrasal verbs, which are themselves complex constituents consisting of a verb and a particle. The rule of Particle Shift moves the particle to the end of the direct object NP; it is obligatory for Pronoun objects, and optional elsewhere.

19. Some verbs (always verbs of transfer) are bitransitive, and may have two objects: the Direct Object (representing the object transferred) and an indirect object (representing the receiver of the transfer), which usually takes the preposition to in English. The rule of Dative Movement (also called Goal Advancement) exchanges the order of the direct and the indirect objects, placing the indirect object (without to) first.

20. Many other verbs may take a Benefactive construction, with for, that indicates the person benefiting from the action described by the VP. Just in case that person winds up possessing the Direct Object as a part of the benefit (a frequent-enough outcome to warrant a provision in the grammar), the benefactive phrase may be treated as if it were an indirect object for the purpose of Dative Movement.

21. Passive constructions have the effect of changing a transitive clause into an intransitive one (more rarely of changing a bitransitive clause into a transitive one). This is accomplished by changing the grammatical relations among the various NP arguments. The Direct Object of the transitive clause becomes the Subject of the passive clause, displacing the original agent Subject (which is optionally expressed – usually at the end of the sentence – in a prepositional phrase with by). The Verb Phrase is changed to reflect this shift, by adding an auxiliary be and changing the verb form to Past Participle.

There is no formal difference between the meaning of a Passive and its corresponding Active sentence; the alternation allows a shift in the Figure-Ground Relation between Agent and Patient, de-emphasizing the importance of the Agent, which isn’t even expressed in the majority of cases.

22. Pronouns (a closed class) are far more common than nouns (an open class), and are used to keep track of Reference, i.e., what entities are participating in the sentence. Special kinds of pronouns, like Reflexives (himself, yourselves), Reciprocals (each other), Demonstratives (this, those), Interrogatives and Relatives (which, who, whether), Indefinites (whatever, one), etc., have special uses and follow special syntactic rules.
Malay ~ Indonesian
(Austronesian)

1. Pisang itu di atas meja itu. 'The banana is on the table.'
2. Bantal itu di bawah meja itu. 'The pillow is under the table.'
3. Bambang di dalam rumah itu. 'Bambang is inside the house.'
4. Bambang sudah di rumah. 'Bambang is already home.'
5. Bapak jalan ke Kuala Lumpur. 'Father travels to Kuala Lumpur.'
6. Bapak sudah jalan ke Banda Aceh. 'Father travelled to Banda Aceh.'
7. Bapak mau jalan ke Jakarta. 'Father will travel to Jakarta.'
8. Orang itu datang dari Jakarta. 'The man comes from Jakarta.'
9. Anak itu sudah di antara meja-meja itu. 'The child was between the tables.'
10. Rumah Bambang di bawah gunung itu. 'Bambang’s house is under the mountain.'
11. Rumah orang itu di antara gunung-gunung itu. 'The man’s house is between the mountains.'
12. Pisang-pisang Bapak sudah di dalam prahu. 'Father’s bananas were in a boat.'
Malay ~ Indonesian  
(Austronesian)

1. Bambang guru.  
   "Bambang is a teacher.

2. Bambang sakit.  
   "Bambang is ill.

   "The teacher is ill.

   "The teacher was ill.

5. Empat orang guru sudah sakit.  
   "Four teachers were ill.

6. Pisang-pisang kuning.  
   "Bananas are yellow.

7. Pisang-pisang tidak putih.  
   "Bananas are not white.

8. Pisang-pisang bukan putih.  
   "Bananas are not white.

   "That fruit's a banana.

    "That fruit's not a banana.

    "Bambang has to leave.

    "Bambang doesn't have to leave.

    "Bambang must not leave.

    "Bambang doesn't have to leave yet.

15. Bambang harus belum pergi.  
    "Bambang must not leave yet.

16. Bambang bukan doktor.  
    "Bambang is not a doctor.

17. Bambang tidak sakit.  
    "Bambang is not ill.

    "Bambang is not ill.

    "Bambang is not a doctor yet.

    "Bambang is not ill yet.

    "There's a doctor at the clinic.

22. Ada tiga orang doktor di klinik itu.  
    "There are three doctors at the clinic.

23. Tidak ada doktor di klinik itu.  
    "There's no doctor at the clinic.

24. Tidak ada tiga orang doktor di klinik itu.  
    "There aren't three doctors at the clinic.

25. Belum ada doktor di klinik itu.  
    "There's no doctor at the clinic yet."
1. Bambang guru.
   'Bambang is a teacher.'
2. Bambang sakit.
   'Bambang is ill.'
   'The teacher is not ill.'
4. Rumah guru itu sedang terbakar.
   'The teacher's house is on fire.'
5. Rumah guru itu sudah terbakar.
   'The teacher's house burnt down.'
6. Rumah Bambang itu tidak besar.
   'Bambang's house is not large.'
7. Bambang melihat rumah guru itu
   'Bambang sees the teacher's house.'
   'Ali didn't eat.'
   'Ali is eating.'
10. Ali mau memakannya anak itu.
    'Ali is going to feed the child.'
    'Ali is going to expand the house.'
    'The teacher bought Ali's house.'
    'A teacher bought Ali's house.'
    'The man's father's house is between mountains.'
15. Pisang-pisang manis Bapak itu sudah di dalam prahu.
    'Father's sweet bananas are already in a boat.'
    'The bananas that Bambang roasted are not very sweet.'
17. Bambang sudah membakar pisang-pisang yang di atas meja itu.
    'Bambang roasted the bananas that are on the table.'
18. Pisang-pisang manis itu di atas meja.
    'The sweet bananas are on the table.'
19. Ali boleh melihat rumah yang sedang terbakar itu
    'Ali can see the house that's on fire.'
    'Ali can see the house that burnt down.'
    'Ali wants to inspect the house of the teacher that burnt down.'
    'The teacher that saw Ali is Bambang's father.'
    'Bambang's father bought the house Ali looked at.'
    'The person who burned Ali's house down is not a teacher.'
    'The house that Ali inspected is on fire.'
Acehnese (Austronesian)

1. Gopnyan ka geu-brébu aneuk nyan.......................... He (polite) fed that child.
2. Jih ji-brébu aneuk nyan................................. He (familiar) feeds that child.
3. Lón ka lón-brébu aneuk nyan................................. I fed that child.
4. Lón lón-ning aneuk nyan................................... I see that child.
5. Gopnyan geu-ning aneuk nyan.............................. He (pol) sees that child.
6. Jih ka jih-ning aneuk nyan................................. He (fam) saw that child.
7. Aneuk nyan ka geu-brébu lé gopnyan............... That child was fed by him (pol).
8. Aneuk nyan ka jih-brébu lé jih......................... That child was fed by him (fam).
9. Aneuk nyan ka lón-brébu lé lón........................ That child was fed by me.
10. Aneuk nyan ka lón-ning lé lón........................ That child was seen by me.
11. Aneuk nyan ka geu-ning lé gopnyan................. That child was seen by him (pol).
12. Aneuk nyan ka jih-ning lé jih........................ That child was seen by him (fam).

Notes: /eu/=[i], /e/=[e], /e/=[ε], /o/=[o], /o/=[o], /ng/=[ŋ], /j/=[ɋ], final /k/=[?]

Acehnese has a system of verb markers that agree with important nouns in the sentence. It also has several types of sentence construction; there are two in this exercise, translated by English Active and Passive (the meanings of these constructions aren't really captured well by the English, but never mind).

1) There are three pronouns in this data. List them and identify the verb agreement marker that corresponds to each one.

2) How is the past tense marked?

3) Describe the normal word order in both types of sentence, and state a rule (in words, not in formalism) that derives one type of sentence from the other (don't forget to describe agreement in stating the rule).
1. Der Lehrer sieht den Studenten.
   'The [masc] teacher sees the [masc] student.'
2. Der Lehrer sieht die Studentin.
   'The [m] teacher sees the [fem] student.'
3. Der Studentin sieht den Lehrer.
   'The [f] student sees the [m] teacher.'
4. Die Studentin sieht den Lehrer.
   'The [f] student sees the [m] teacher.'
5. Die Lehrerin sieht die Studentin.
   'The [f] teacher sees the [f] student.'
   'The [m] teacher helps the [m] student.'
7. Der Lehrer hilft der Studentin.
   'The [m] teacher helps the [f] student.'
8. Der Lehrer hilft der Lehrerin.
   'The [m] teacher helps the [f] teacher.'
   'The [f] teacher helps the [m] teacher.'
    'The [f] teacher helped the [m] teacher.'
11. Der Student hat der Studentin geholfen.
    'The [m] student helped the [f] student.'
12. Der Lehrer hat den Studenten gesehen.
    'The [m] teacher saw the [m] student.'
    'The [f] teacher saw the [f] student.'
    'The [f] teacher is seen by the [m] teacher.'
15. Die Studentin wird von der Lehrerin gesehen.
    'The [f] student is seen by the [f] teacher.'
16. Dem Lehrer wird vom Student geholfen.
    'The [m] teacher is helped by the [m] student.'
17. Der Studentin wird von der Lehrerin geholfen.
    'The [f] student is helped by the [f] teacher.'
    'The [f] student was seen by the [f] teacher.'
    'The [m] teacher was helped by the [f] teacher.'
20. Der Studentin ist vom Student geholfen worden.
    'The [f] student was helped by the [m] student.'
Basque (Isolate)

Account for the relationship between sentences with main clauses and sentences with relative clauses in Basque

Main clauses

1) gizona ona da
   the man is good
2) sagarrak ontuak dira
   the apples are ripe
3) anderea serora da
   the lady is a nun
4) gizona zuhaitza da
   the man is mean
5) semea aheza du
   his son is a priest
6) liburu hau gurea da
   the book is ours
7) semea handia da
   his son is tall
8) arreba abogadu du
   his sister is a lawyer

Relative clauses

1) ona den gizona
   the man who is good
2) ontuak diren sagarrak
   the apples that are ripe
3) serora den anderea
   the lady who is a nun
4) zuhaitza den gizona
   the man who is mean
5) semea aheza duen aita
   the father whose son is a priest
6) jau gurea den liburu
   the book that is ours
7) handia den semea
   the son who is tall
8) arreba abogadu duena mutiko
   the boy whose sister is a lawyer
English *wh*- Questions

1) The director presented the report at the meeting this morning.
2) Did the director present the report at the meeting this morning?
3) Who presented the report at the meeting this morning?
4) What did the director present at the meeting this morning?
5) Where did the director present the report this morning?
6) When did the director present the report at the meeting?
7) What did the director do this morning?
8) What did the director do at the meeting?
9) What did the director do with the report?
10) He sliced the salami with a cleaver because the knife was dirty.
11) Who sliced the salami?
12) Why did he slice the salami with a cleaver?
13) How did he slice the salami?
14) *How he sliced the salami?*
15) What did he slice the salami with?
16) What did he slice with a cleaver?
17) What did he slice?
18) What did he do with the cleaver?
19) What did he do with the salami?
20) What did he do?
21) *What he did?*
22) Why did he do that?
23) *Why he do?*
24) I know how he sliced the salami.
25) *I know how did he slice the salami.*
26) I know who sliced the salami.
27) I know what he did.
28) *I know what did he do.*
29) I know why he did that.
30) I know why he did.
31) I know why.
32) I know.
33) He told me what the director did this morning.
34) Why he sliced the salami with the cleaver is obvious.
35) It's obvious why he sliced the salami with the cleaver.
36) When the director presented the report is not yet clear.
37) It's not yet clear when the director presented the report.
38) *It's not yet clear when did the director present the report.*
Ergativity

V NP\textsubscript{1} \textbf{Intransitive} sentence (only 1 noun phrase)

*The dog walked. The door opened. Bill is asleep. Mary is a doctor.*

V NP\textsubscript{1} NP\textsubscript{2} \textbf{Transitive} sentence (2 noun phrases)

*The man walked the dog. Bill opened the door. She read three books.*

V NP\textsubscript{1} NP\textsubscript{2} NP\textsubscript{3} \textbf{Bitransitive} sentence (3 noun phrases)

*I sent Mary the book. Mary gave Bill a cold. We elected Tom chairman.*

<table>
<thead>
<tr>
<th>Accusative System</th>
<th>Ergative System</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <strong>dog-NOM</strong> walked.</td>
<td>The <strong>dog-ABS</strong> walked.</td>
</tr>
<tr>
<td>The <strong>man-NOM</strong> walked the <strong>dog-ACC</strong>.</td>
<td>The <strong>man-ERG</strong> walked the <strong>dog-ABS</strong>.</td>
</tr>
<tr>
<td>The <strong>door-NOM</strong> opened.</td>
<td>The <strong>door-ABS</strong> opened.</td>
</tr>
<tr>
<td>The <strong>man-NOM</strong> opened the <strong>door-ACC</strong>.</td>
<td>The <strong>man-ERG</strong> opened the <strong>door-ABS</strong>.</td>
</tr>
</tbody>
</table>

**Ergativity even in English**

a) & They objected to the \textit{shooting} of the hunters. (\& = ambiguous)

= (1) ... the fact that somebody shot the hunters. \textbf{(Transitive shoot)}

= (2) ... the fact that the hunters shot. \textbf{(Intransitive shoot)}

In choosing the prepositional object to appear with \textit{of} in an -\textit{ing} nominalization phrase (e.g., the \textit{V-ing of NP}), V chooses its Absolutive – i.e., a Transitive V chooses its Direct Object, while an Intransitive V chooses its Subject.

b) The -\textit{ee} suffix.

\begin{tabular}{ll}
Bill has retired & \rightarrow Bill is a \textit{retiree}. & \textbf{Intransitives} \\
Bill has escaped. & \rightarrow Bill is an \textit{escapee}. \\
Bill is standing. & \rightarrow Bill is a \textit{standee}. \\
They employ Mary & \rightarrow Mary is an \textit{employee}. & \textbf{Transitives} \\
They inducted Mary. & \rightarrow Mary is an \textit{inductee}. \\
They appointed Mary. & \rightarrow Mary is an \textit{appointee}. \\
\end{tabular}

Adding the suffix -\textit{ee} to a verb produces a label for a person who is the Absolutive of the verb – i.e., a person who is the Direct Object of a Transitive verb, or the Subject of an Intransitive verb.
Pitjantjara (Pama-Nyungan) 1

1. ŭlkamāṭalu piṭi τawaŋu.........................The echidna dug a hole.
2. papalu ŭlkamāṭa ḥaŋu..........................The dog saw the echidna.
3. ŭngiũlu ŭlkamāṭa waŋaŋu.....................The snake told the echidna.
4. papalu maŋu paŋaŋu............................The dog made a nest.
5. ŭlkamāṭalu papa waŋaŋu.....................The echidna followed the dog.
6. ŭngiũlu yapu paŋaŋu..........................The snake dropped a stone.
7. papalu yapu ḥaŋu..............................The dog saw the stone.
8. papalu ŭngi kuliŋu..............................The dog heard the snake.
9. ŭlkamāṭalu papa kuliŋu......................The echidna pricked the dog.
10. papalu ŭngi paŋaŋu............................The dog bit the snake.
11. ŭngiũlu ŭlkamāṭa guŋaŋu.................The snake frightened the echidna.
12. yapuũlu papa yiluŋtialu........................The stone killed the dog.
13. papa paŋaŋka ŭnataŋu........................The dog sat on the ground.
14. ŭlkamāṭa gaŋkulpag्...........................The echidna returned.
15. ŭngi maŋiŋaŋu.................................The snake went away.
Pitjantjara (Pama-Nyungan)

1. watiŋku kulpirpa ɲalakatiŋu......................... The man brought the kangaroo.
2. ṯiŋi ɲuraŋka ɲinaŋu.............................. The child sat in camp.
3. papapa ɲapaŋka ɲinaŋu............................ The dog sat on the ground.
4. papapaŋku ṯiŋi paŋatu............................. The dog bit the child.
5. ṯiŋi yulaŋu........................................ The child cried.
6. gayulu ṯiŋi kuliru.................................. I heard the child.
7. watiŋku ɲura wantinu.............................. The man left the camp.
8. watiŋku kulpirpa kuliru............................ The man speared the kangaroo.
9. kulpiru wati piriru................................. The kangaroo scratched the man.
10. yuŋtalpu ṯiŋi maṉṯinu.............................. The daughter picked up the child.
11. miŋna ɲalakupilŋu................................. The woman returned.
12. miŋmaŋku ɲayuŋa ɲagu............................. The woman saw me.
13. gayulu miŋmaŋwaŋṯanu............................ I told the woman.
14. gayulu mirpaŋariŋu................................. I became angry.
15. ɲura ɲayuŋa ɲaṉgu................................. You saw me.
16. miŋmaŋku ɲuraŋa ɲaṉgu............................. The woman saw you.
17. yuŋtalpa ɲalapiŋtu................................. The daughter came.
18. kulpirpa iliriru...............................The kangaroo died.
19. miŋma mapiŋtu.................................The woman went away.
20. gayulu ṯiŋi makatiŋu............................ I carried the child away.
21. ɲuŋulu ɲayuŋa ɲaṉgu............................. Nunu saw me.
22. paluŋu wati waŋṯanu.............................. He told the man.
23. watiŋku paluŋa kuliru............................ The man heard him.
24. watiŋku ɲempiŋa ɲaliŋtu.......................... The man called Ampin.
25. ɲempiŋa pakanu.................................Ampin got up.
26. paluŋu mapiŋtu.................................He went away.
Pitjantjara (Pama-Nyungan)

27. āura ngalapiṭagu........................................................................ You came.
28. ampintu āuraña ḥaŋu................................................................... Ampin saw you.
29. ɡanaŋa ḥinakatigu................................................................. We (pl) sat down.
30. ɡanaŋa yuŋalpa yaŋtigu...................................................... We (pl) called the daughter.
31. gali yuŋtalpa ṭapini............................................................... We (2) asked the daughter.
32. watiŋku ɡanaŋaŋa ḥanapu...................................................... The man followed us (pl).
33. ampintu ɡaliŋa yaŋtigu............................................................ Ampin called us (2).
34. ḥuramuka ṭiti kulinu............................................................. You (pl) heard the child.
35. pilįliu ḥuramukaŋa ḥaŋu......................................................... Pili saw you (pl).
36. ṭana ṭiti makatigu................................................................. They (pl) carried the child away.
37. ṭiŋku ṭanaŋa piriŋu............................................................... The child scratched them (pl).
38. ṭana ṭiŋka ḥinaŋu................................................................. They (pl) sat on the child.
39. ṭana pakaŋu.............................................................................. They (pl) got up.
40. pilįliu mirpaŋarariŋu.............................................................. Pili was angry.
41. watiŋku pilįliŋa puŋu............................................................. The man hit Pili.

Answer all of the following and cite examples to prove your points:

A) Describe the transitive and intransitive constructions.

B) Describe the pattern(s) of noun phrase marking in transitive and intransitive constructions. How many markers are there, and what are they used for? Are there any special lexical classes — i.e., are there any sets of nouns that seem to get special treatment, for which we need different rules?

C) Give paradigms for the personal pronouns, and compare their marking pattern with that of nouns.
Subject Complement Structure

Object Complement Structure
Syntax Quiz Study Sheet

Draw tree structures for each of the following sentences. Circle all modal auxiliary verbs.

1) a Bill has run over the dog.
   b Indicate by an arrow in this tree what the relation of this sentence is to Bill has run the dog over.

2) a The woman who will cook our dinner is my mother.

3) Frank will be leaving for Chicago.
Logic is to language and meaning as mathematics is to physical science. In order to understand how sentences—which are what compose language—work, it is necessary to learn to find their logical structure. This doesn’t tell us everything about the sentence, but it does provide a skeleton on which the other parts of the sentence can be fleshed out, the same way $E=mc^2$ doesn’t tell you how matter converts into energy, just that it does.

Luckily, logic is much, much simpler to learn than other varieties of mathematics. For one thing, numbers and arithmetic play no role whatsoever in logic. Logic is all about relationships between chunks of meaning, which are called Propositions. Propositions are composed of Predicates and Arguments. Roughly speaking, Propositions are the skeletons of sentences; Predicates are the skeletons of verbs (or adjectives), and Arguments are the skeletons of nouns (or pronouns). Almost everything else in a sentence is pretty much ignored in logic; it’s only interested in the skeletal parts.

The way you use logic in grammar is to take a sentence and dissect it into its logical skeleton. For instance, $Bill$ ran is a very simple sentence, with only one verb and one noun. It corresponds to the Proposition run ($Bill$). (We use SMALL CAPS to represent logical formulae, to distinguish them from actual chunks of language, which are italicized.) Notice that the verb in the sentence $Bill$ ran is in the past tense, but the Predicate in run ($Bill$) is not; logic normally ignores tense, so this is also the skeleton of $Bill$ runs.

Also notice that the Predicate run comes first, followed by the Argument $Bill$, in parentheses, even though the words $Bill$ and ran occur in the opposite order in the sentence. This is always the order in a Proposition, no matter where words occur in the actual sentence; the Predicate comes first, followed by its Argument (or Arguments—there can be up to three, separated by commas), in parentheses.

Let’s try another sentence: $Bill$ kicked the ball. The corresponding Proposition is kick ($Bill$, ball). By convention, the first Argument inside the parentheses is the Subject of the sentence (in English, all sentences must have a Subject, and it’s prototypically the Agent of the action denoted by the verb); the next Argument, if there is one, is the Direct Object. A sentence whose corresponding Proposition has two Arguments is called a Transitive sentence; a sentence with only one Argument (like $Bill$ ran) is called Intransitive.

Notice, once again, that tense is ignored in the Proposition; notice also that the definite article the is also ignored. If the Object had been plural balls instead of singular ball, that would have been ignored, too. Logic is only concerned with skeletons and the connections of their parts.

Some Predicates can take three Arguments; these are called Bitransitive. Most bitransitive Predicates have to do with transfer or movement of something from one place (or person) to another. For example, $Bill$ threw the ball to John is bitransitive, and its corresponding Proposition is throw ($Bill$, ball, John). The three Arguments, in order, are Subject, Direct Object, and Indirect Object; they have, respectively, the roles (meanings) of Source, Trajector, and Goal. Semantically, the Trajector is what moves, and it moves from Source to Goal, usually with energy provided by the Source. Notice that the preposition to is ignored here; the Arguments will appear in this order by convention.

And that’s it. That’s how Propositions are formed: Predicate (Arguments). This is called Predicate Calculus. We will return to Predicate Calculus shortly.
Logic Study Guide

The other part of logic has to do with combinations and elaborations of Propositions, and it's called **Propositional Calculus**. It's much simpler than Predicate Calculus.

One elaboration of a Proposition is called **negation** and consists of using *not*, as in the sentence: *Bill didn't kick the ball*. The corresponding Proposition is \( \neg \text{KICK (BILL, BALL)} \). The symbol \( \neg \) is a logical **truth functor**; it's pronounced simply as 'not'. It can be applied to any Proposition, yielding a new Proposition, with opposite **Truth Value**.

One of the simplest kinds of combination is a functor called **conjunction** and consists of putting *and* between two sentences: *Bill kicked the ball and John caught it*. The corresponding Proposition is \( \text{KICK (BILL, BALL)} \land \text{CATCH (JOHN, BALL)} \). The symbol \( \land \) is the logical *and* truth functor; it is defined in logical terms, and is not to be confused with the English conjunction *and*, though it's pronounced 'and'. It can connect any two Propositions, yielding a new Proposition. Note that the pronoun *it* in this sentence refers to *the ball*, so *BALL* is the Argument used for *it* in the Proposition; logic has no pronouns, only Arguments. If we were being very, very careful and formal, we'd have to mark both instances of the argument *BALL* with the same **referential index** 'i' as *BALL*, just to point out that they did in fact refer to the same ball.

Another, related, kind of combination is a functor called **alternation** and consists of putting *or* between two sentences: *Bill kicked the ball or John kicked the ball*. The corresponding Proposition is \( \text{KICK (BILL, BALL)} \lor \text{KICK (JOHN, BALL)} \). The symbol \( \lor \) is the logical *or* truth functor; like \( \land \), it is defined in logical terms and is not at all identical to the English conjunction *or*, but it can combine any two Propositions and yield a new Proposition. Note that this sentence can be shortened to *Bill or John kicked the ball*; the logical statement is the same, either way.

\( \neg, \land \) and \( \lor \) are defined, like all truth functors, in terms of **Truth Tables**. Logic is so simple because it abstracts away from what we think of as meaning and largely ignores it; in logic, there are only two possible 'meanings' (also called Truth Values) for **any** Proposition: True and False. Therefore it is easy to specify precisely the truth values for any combined Proposition, since there is a very limited number of possible combinations. In particular, if \( p \) and \( q \) represent any Proposition at all, the Truth Tables for \( \neg, \land \) and \( \lor \) are:

<table>
<thead>
<tr>
<th>( \neg )</th>
<th>( p )</th>
<th>( p )</th>
<th>( \land )</th>
<th>( q )</th>
<th>( p )</th>
<th>( \lor )</th>
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</table>

The first two columns say that if \( p \) is True, then \( \neg p \) is False, and vice versa. The truth values of the Proposition \( \neg p \) in each line are conventionally put under the functor (here \( \neg \)) in a Truth Table. That's all there is for negation, since it only applies to a single Proposition (i.e., it's a **monadic functor**), and that Proposition has only two possibilities. We say there are only two lines in the Truth Table of \( \neg \).
By contrast, $\land$ and $\lor$ are \textit{dyadic functors}, combining two Propositions each. This means there are 4 possible combinations of T and F for the two Propositions, so there are four lines in their Truth Tables. The top line (where both $p$ and $q$ are True), and the bottom line (where both are False), are identical for $\land$ and $\lor$. In the first case, both $\land$ and $\lor$ are True, while in the last case, they're both False. It is the middle two lines where the difference lies: if either $p$ or $q$ is False, then $p \land q$ is False; but if either $p$ or $q$ is True, then $p \lor q$ is True. The result is that the Truth Table of $\land$ can be summarized (just reading down the values of the column under $\land$) as $\text{TTFF}$, while the Truth Table of $\lor$ is $\text{TTTF}$.

In fact, this is actually pretty close to our ordinary understanding of what \textit{and} and \textit{or} mean: in order for $p$ \textit{and} $q$ to be True, both Propositions have to be True, whereas in order for $p$ \textit{or} $q$ to be True, only one needs to be True. (One might note that there is a different use of \textit{or} in English, which represents a different dyadic functor, with the Truth Table $\text{FTTF}$, i.e., $p$ or $q$ can be False when both $p$ and $q$ are True; we usually emphasize this sense in English by using \textit{either...or}, as in \textit{Either John or Bill kicked the ball}. This functor is called \textit{exclusive or} (or \textit{disjunction}) and it is important in computer design, where it is symbolized $\text{XOR}$. Logic normally does not distinguish between these two functors, and neither will we, unless necessary.)

Since truth functors are defined exclusively in terms of Truth Tables, which amount to permutations of T and F, it follows that there are 4 monadic truth functors ($2^2=4$): $\text{TT}$, $\text{TF}$, $\text{FT}$, and Negation, which is $\text{FT}$; except for Negation, the others are all irrelevant. Likewise, there are 16 possible dyadic truth functors ($2^4=16$), ranging from $\text{TTTT}$ through $\text{FFFF}$. Most of these are merely mathematical curiosities, but there are two more dyadic functors besides $\land$ and $\lor$ that are of interest in natural language. Below are the Truth Tables for them:

<table>
<thead>
<tr>
<th>$p$</th>
<th>$\equiv$</th>
<th>$q$</th>
<th>$p$</th>
<th>$\supset$</th>
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The first one is \textit{logical equivalence}, symbolized by `$\equiv$`. The Truth Table for $\equiv$ is $\text{TFFT}$; i.e., $p \equiv q$ is True whenever $p$ and $q$ are either both True or both False. Notice that, under this definition, any Proposition that is always True, like $\text{Two plus three equals five}$, is logically equivalent to all other Propositions that are always True, like $\text{December 31 is the last day of the year}$, or $\text{The moon is not made of green cheese}$. While this is far from what we ordinarily mean by `equivalent`, remember that the only meanings allowed in logic are T and F; this is a logical result.
The second one is *material implication*, symbolized by ‘⊃’ (called ‘horseshoe’). Unlike all the other dyadic functors we’ve seen so far, implication is not symmetric; i.e., while it doesn’t matter what order we write \( p \equiv q \), \( p \land q \), or \( p \lor q \), it does matter when we write \( p \supset q \). Put logically, \( p \land q \) is equivalent to \( q \land p \) [in symbols, \((p \land q) \equiv (q \land p)\)], but \( p \supset q \) is not equivalent to \( q \supset p \) [in symbols, \(-(p \supset q) \equiv (q \supset p)\)]). (Note, parenthetically, how the parentheses pile up fast in logical formulae; we’ll return to this a bit later.) The Truth Table for \( \supset \) is **TFTT**.

\( \supset \) is often glossed as ‘if...then’ and is the basis of logical accounts of deductive thought, especially syllogisms. The first line of the Truth Table for \( \supset \) supports this: \( p \supset q \) is True if both \( p \) and \( q \) are True. Certainly that’s what we mean by saying things like ‘If Caesar is dead, then he can’t come to tea’. We say this is a *valid inference*, and deductively correct; that’s what the ‘T’ in the Truth Table means. The most direct mode of the syllogism, called Modus Ponens, goes like this: \( p \supset q \) is True; but \( p \) is True; therefore \( q \) is True [in symbols, \((p \supset q) \land p \supset q\)]. From the correctness of the statement above, and the fact that Caesar is dead, we conclude that indeed he can’t come to tea. (Logic is not rocket science)

The second line of the Truth Table says that \( p \supset q \) is False if \( p \) is True but \( q \) is False; i.e., if the premise is True but the conclusion is False, the inference is **invalid**. This also tends to support the ‘if...then’ interpretation of \( \supset \); we would like to be able to say that *If two plus two equals four, then the Moon is made of green cheese* is not a valid inference. So far, so good.

It is the last two lines of the Truth Table for \( \supset \) that give people the most trouble. They seem to say that *If two plus two equals three, then the Moon is made of green cheese* is True, and so is *If two plus two equals three, then the Moon is not made of green cheese*. Certainly this is not what anybody means by ‘if...then’, and it can hardly be said to be good clear thinking. Or can it?

As it turns out, these are necessary for correct reasoning. Consider the last line, for instance: the mode of the syllogism called *Modus Tollens* goes like this: \( p \supset q \) is True; but \( q \) is False; therefore \( p \) is False [in symbols, \((p \supset q) \land \neg q \supset \neg p\)]; an example is *If he was hungry, he would have eaten. But he didn’t eat. Therefore he wasn’t hungry*.

In order for Modus Tollens to work, \( p \supset q \) has to be True (i.e., a correct inference) when both \( p \) and \( q \) are False.

Taken together, the last two lines of the Truth Table for \( \supset \) say that from a False premise, *any* Proposition at all can be correctly deduced; in other words, be very careful not to assume False premises. This is what lies at the root of Proof by Contradiction, which starts by assuming some Proposition (\( p \)) and then showing that it leads to a contradiction: \( (p \supset q) \land (p \supset \neg q) \). The conclusion of this contradiction must then be that \( p \) is False (\( \neg p \)). In other words, the last two lines of the Truth Table for \( \supset \) allow us to reason from contradictions, and are thus very valuable, if confusing.
Truth Tables can also be used to prove statements that are formed with truth fun-
c tors. For instance, a theorem of logic called Reduction of Implication shows that $\supset$ is not
in fact necessary, since it's equivalent to a combination of $\neg$ and $\vee$. The statement of the
theorem is: $(p \supset q) \equiv (\neg p \vee q)$: in words, "P implies Q is equivalent to Not-P or Q".
The truth table has only four lines, since there are only two arguments; here it is with only
the values for $p$ and $q$ filled in - the basic state of a Truth Table:

<table>
<thead>
<tr>
<th>$(p$</th>
<th>$\supset$</th>
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<th>$(\neg$</th>
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The basic state simply distinguishes the four possible combinations of the truth
values of $p$ and $q$, and thus the four lines of the table; we have added the canonical TTTT
truth table for $\supset$, since it's already been given. So far we don't know what the truth value
of the proposition as a whole is; but there are simple rules for finding out. As in algebra,
we work from the inside out. Here the 'inside' is the simply negated proposition $\neg p$. So
we fill in the truth values for that, which go in the column under the functor $\neg$.

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<th>$(p$</th>
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Now we can fill in the truth values for the $\lor$, using the values for $\neg p$ instead of $p$
and $\lor$-ing them with the values for $q$ to remove the parentheses:

<table>
<thead>
<tr>
<th>$(p$</th>
<th>$\supset$</th>
<th>$q)$</th>
<th>$\equiv$</th>
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Now we have removed all the parentheses; the second column contains the truth
values of the left-hand proposition, and the seventh column now contains the truth values
of the right-hand proposition. Note that these two columns are identical: TTTT. That
means that whenever one is true the other is true, and whenever one is false the other is
false. That's a definition of logical equivalence; as the final truth table shows, the truth
value of the entire theorem, shown in the fourth column, is TTTT.
<table>
<thead>
<tr>
<th>( p \supset q )</th>
<th>( p \lor q )</th>
<th>( \neg )</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
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That is, this proposition is true under all circumstances, true no matter what its constituent propositions are, true no matter whether they're true or false, true of everything, everywhere, and forever. It's logically true. It's been proven. It's a theorem.

It also means that we may substitute \( \neg p \lor q \) for \( p \supset q \) whenever we like in any proposition, without changing the truth value (salva veritate). There are thousands (actually, a countably infinite number, but we don't have time for all of them) of other theorems that are or can be proven. Proving them is the business of logic, for the most part.

However, since we are not logicians, we have a much simpler task. We need only know (and be able to apply) the truth tables of \( \neg, \lor, \land, \supset, \equiv \). In addition, we need to be aware of the following important theorems, and their meaning (some of these are actually axioms or postulates, instead of theorems; the difference only matters to logicians, since all are logically true). As an exercise, you should test your understanding of each by putting it into reasonably clear English.

- **Law of Contradiction**: \( \neg(p \land \neg p) \)
- **Law of Excluded Middle**: \( p \lor \neg p \)
- **Double Negative Law**: \( \neg(\neg p) \equiv p \)
- **Reduction of Equivalence**: \( (p \equiv q) \equiv ((p \supset q) \land (q \supset p)) \)
- **Reduction of Implication**: \( (p \supset q) \equiv (\neg p \lor q) \)
- **Disjunctive Syllogism**: \( ((p \lor q) \land \neg q) \supset p \)
- **Hypothetical Syllogism**: \( ((p \supset q) \land (q \supset r)) \supset (p \supset r) \)
- **Modus Ponens**: \( ((p \supset q) \land p) \supset q \)
- **Modus Tollens**: \( ((p \supset q) \land \neg q) \supset \neg p \)
- **Contrapositive Law**: \( (p \supset q) \equiv (\neg q \supset \neg p) \)
- **De Morgan's Laws**: \( \neg(p \lor q) \equiv (\neg p \land \neg q) \)
\( \neg(p \land q) \equiv (\neg p \lor \neg q) \)
Now that we have mastered Propositional Calculus (or at least all of it that one needs to know) we can return to Predicate Calculus. While Propositional Calculus is concerned with Propositions (and sentences) as a whole, and therefore studies rules of logic that apply to any Proposition, Predicate Calculus is concerned with the parts of Propositions (and sentences): Predicates and Arguments.

Recall from p.1 that there are three main kinds of Propositions (and sentences) in terms of how many arguments occur with them: the Intransitive, or One-place predicates, with only one Argument; the Transitive, or Two-place predicates, with two Arguments; and the Btransitive, or Three-place predicates, with three Arguments. (To this we may add the Impersonal, or Zero-place predicates, with no Arguments at all, as in It’s raining, represented logically as RAIN(); this is a special and rather rare case and doesn’t feature into logic much, though it’s important in English syntax, since English requires every sentence to have a subject, whether or not it represents a Proposition with an Argument.)

[By the way, at this point in the discussion I intend to stop capitalizing the basic terms used in logic and linguistics, on the argument that by now they should be familiar to you. I will continue to write new terms in bold italics, and occasionally to Capitalize them, when they first appear in the text. That is your cue to learn to recognize them when they pop up in the discussion again. Clea? OK, onward.]

Every proposition must have a predicate and (except in the case of impersonals) at least one argument, in just the same way every sentence of English (or any other language) must have a verb or an adjective or a noun that predicates some idea. (Note that ‘to predicate’, the verb in bold italics in the preceding sentence, while obviously related to the noun predicate, is pronounced differently: the final syllable in the verb predicate /prɪdɪˈkeɪt/ has a secondary stress and is pronounced like Kate, while the final syllable in the noun predicate /prɪdɪˈkeɪt/ is unstressed and is pronounced like cut. The noun predication /prɪdɪˈkeɪʃən/ is derived from the verb and means ‘the act of predicating.’)

And just what does ‘to predicate’ mean? Well, it’s the basic abstraction in a sentence: it’s what one says about the arguments. So, in John is tired, what one predicates of John is the state of being tired: TIRED (JOHN); tired is an adjective, so be tired is a predicate adjective. In Bill is a doctor, what one predicates of Bill is the quality of being a doctor: DOCTOR (BILL); doctor is a noun, so be a doctor is a predicate noun. In John kicked the ball, what one predicates of John and ball is the action of kicking: KICK (JOHN, BALL); kick is a verb, and verbs are the prototype predicates, so we don’t have to call kick a ‘predicate verb’.

Note that predicate adjectives and predicate nouns, not being prototype predicates, are required by English grammar to have some form of be appearing right before them, and that predicate nouns in English require in addition an indefinite article a following the be. This is a general and quite automatic fact about English grammar, however, and it is ignored by logic since it doesn’t contribute to meaning; thus we say that TIRED, DOCTOR, and KICK are the predicates of these propositions, and basically ignore the automatic be and a in the predicates, the same way we ignored the automatic the in the ball.

Predication is an extremely general concept; it is at the basis of all human language, and is the first significant linguistic concept acquired by most children when they learn their native language. At the ‘two-word’ stage in ‘bottom-up’ language acquisition,
when children learn to put together more than one word (e.g., Doggie bye-bye), what they are in fact learning is predication. What is being predicated of the argument doggie in Doggie bye-bye is some concept of departure or absence, derived from the behavior label bye-bye, and used as a predicate in this proposition. It is an immensely impressive intellectual achievement to take a term that is learned as a vocal accompaniment of a hand gesture and generalize it to a predicate of departure, capable of applying to any argument.

In addition, predication is recursive. That is, one can predicate something of a proposition as a whole, not just a noun. Put another way, propositions can be arguments of other propositions, in much the same way that mathematical functions can be composed with other functions: \( y = f(g(x)) \). For example, in Bill wants Mary to leave, there are two propositions (or clauses), each with its own predicate and its own arguments. One of the propositions (or clauses) is dependent, or subordinate, to the other proposition, which is the independent, or main, or matrix clause. The subordinate clause is (for) Mary to leave, and its corresponding proposition is LEAVE(MARY). The main clause contains the subordinate clause as an argument (the direct object – what Bill wants – of its predicate want); the corresponding proposition is WANT(BILL, LEAVE(MARY)). Note the extra parentheses.

(By the way, there are many other kinds of subordinate clauses; this is just one example. To be precise, this is a direct object infinitive complement clause, a kind of noun clause.)

This kind of recursion can be carried on indefinitely, leading to arbitrarily long sentences: Bill said that Mary thought that John intended Bill to say that Mary thought that John intended Bill to say that ... [SAY(BILL, THINK(MARY, INTEND(JOHN, (SAY(BILL, THINK(MARY, INTEND(JOHN, SAY(BILL, ...)))))))).] It is very, very common; the majority of English sentences contain one or more subordinate clauses, of which complement clauses like these are the most important, logically and syntactically.

Arguments, too, can be complicated. Arguments are normally nouns or pronouns, referring to entities, in the same way that predicates refer of events or states. However, while logic normally ignores articles like a and the that modify nouns, and normally treats adjectives as predicates even when they modify nouns, there is one additional kind of little word attached to arguments that is crucial to the meaning of sentences and figures prominently in logic. That little chunk of meaning is the quantifier.

It has been known since Aristotle that there were two different kinds of proposition that had different effects in syllogisms. Suppose one considers the difference between All Hoosiers are right-handed and Some Hoosiers are right-handed. If it is the case that all Hoosiers are right-handed, then it follows trivially that some of them are. However, the reverse is not true: from the fact that some Hoosiers are right-handed, we cannot conclude anything about all Hoosiers. The difference is clearly due to the words all and some, which are examples of quantifiers, a syntactic category ('Part of Speech') in all languages, and also a form of logical functor (actually, in formal logic, quantifiers are called operators, not functors; once again, the difference is only relevant to a logician). There are many different kinds of quantifier in natural language, but logic uses only two abstract varieties: the universal quantifier (each, every, any, all; symbolized by \( \forall \)) and the existential quantifier (some, there exists, at least one; symbolized by \( \exists \)).
In formulas, these quantifier symbols are placed at the beginning of the proposition, before the predicate, which in turn comes before the arguments that the quantifiers modify. In order to match up each quantifier with the argument that it binds, one uses *variable* symbols (typically \(x\) and \(y\), just like algebra). Thus *Somebody ate peaches* is symbolized as \((\exists x) \text{EAT}(x, \text{PEACHES})\); that is, in some case, there was a person that ate peaches. Likewise *Everybody ate peaches* is symbolized as \((\forall x) \text{EAT}(x, \text{PEACHES})\); that is, in every case, there was a person that ate peaches.

One can be more specific about the universe of discourse of quantifiers; in particular, it is often useful to use *restricted quantifiers* with limited reference. For instance, in the examples of the preceding paragraph, it is taken for granted that the argument \(x\) that is bound by the quantifiers is restricted to ("quantifies over") *people*. However, this is not a given in logic, and ought to be specified if one is being precise. One way of doing this is to include the restriction in the quantifier statement. Thus instead of the formal statements in the preceding paragraphs, one could say \((\exists x: \text{PERSON}(x)) \text{EAT}(x, \text{PEACHES})\) and \((\forall x: \text{PERSON}(x)) \text{EAT}(x, \text{PEACHES})\); that is, in either some or all cases of *persons*, the person ate peaches. If everyone is clear about the presuppositions, this is not necessary, but one should always be prepared to be more specific if necessary, since that is what logic is for.

We say that a quantifier *binds* an argument it refers to, or that it *quantifies over* cases of such an argument. It is possible to bind more than one argument in a proposition (though each binding requires a different quantifier), and in such a case, we find that the formal notation provides a benefit, disambiguating a potentially ambiguous sentence. Thus, in the sentence *Every boy read some book*, there are two possible readings: either there is some book (say *Moby Dick*) that every boy read, or each boy read a unique book (which might possibly be the same in any two cases, but need not be — Bill read *Moby Dick*, Frank read *Small Gods* and so did Joe, but Mark read *Tropic of Capricorn*).

These two cases are represented by the handy logical fact that if there are two quantifiers in any proposition, they can occur in two possible orders, since they are not part of the arguments they bind. Thus the two cases above are represented as \((\exists y: \text{BOOK}(y)) (\forall x: \text{BOY}(x)) \text{READ}(x, y)\), and \((\forall x: \text{BOY}(x)) (\exists y: \text{BOOK}(y)) \text{READ}(x, y)\). That is (respectively), there is some book such that for every boy, that boy read the book; and, for every boy, there is some book such that that boy read the book.

We say, in the first case, that the existential quantifier \(\exists\) is *outside the scope* of the universal quantifier \(\forall\), while the universal is *inside the scope* of the existential; or, alternatively, that the existential quantifier has *wide scope*, while the universal has *narrow scope*. Reverse ‘universal’ and ‘existential’ to describe the second case; either way, the *scope* of a quantifier is the relevant technical term. This kind of ambiguity comes about because natural language normally requires quantifiers to modify (and thus appear with) the arguments they bind, which does not always allow scope to be specified. This is called a *quantifier-crossing* (or Q-Crossing) *ambiguity* in the syntactic trade; in logic, of course, it does not arise because the scope of quantifiers *must* be specified.

Quantifiers may only bind arguments, not predicates. This restriction results in a theory called *First-Order Quantified Predicate Calculus*. The ‘first-order’ part means
that quantification is restricted to arguments; if quantification over predicates were allowed, it would be Second Order. The significance here is that first-order quantified predicate calculus has been mathematically proven to be consistent, and thus useful for all kinds of mathematical and engineering purposes, while second-order has been proven to be inconsistent, which means that one can’t rely on logical calculi to produce correct results with it. Thus logicians (and mathematicians and engineers) are restricted to first-order calculi. This doesn’t mean that human language is, of course, just that logic can only go so far in modelling it.

Similar kinds of ambiguities arise when negatives occur with quantifiers: All the boys didn’t leave can mean either that some left but some didn’t, or that they all stayed. Respectively, these correspond to \( \neg(\forall x: \text{BOY}(x)) \text{LEAVE}(x) \) or \( (\forall x: \text{BOY}(x)) \neg\text{LEAVE}(x) \).

That is, it makes a difference when a negative appears with respect to a quantifier. A negative on one side of a quantifier has a different meaning from one on the other side. This quantifier-negative (or Q-Neg) ambiguity is in fact a consequence of De Morgan’s Laws, which we saw before in terms of the functors \( \land \) and \( \lor \). In fact, the quantifiers \( \lor \) and \( \exists \) have a natural relation to the functors \( \land \) and \( \lor \) (respectively).

\((\exists x)\) refers to some \( x \) i.e., \( x \), or \( x \), or \( x \), or \( x \), or …; while \((\forall x)\) refers to all \( x \): i.e., \( x \), and \( x \), and \( x \), and \( x \), and … Thus De Morgan’s Laws, stated in terms of quantifiers instead of functors, where \( P \) represents any predicate at all, are: \( \neg(\forall x) P(x) \equiv (\exists x) \neg P(x) \) and \( \neg(\exists x) P(x) \equiv (\forall x) \neg P(x) \). That is, if \( P \) is not true for all \( x \), then there is some \( x \) such that \( P \) is false; while if there is no \( x \) such that \( P \) is true for that \( x \), then for all \( x \), \( P \) is false.

Indeed, these are only two of the forms in which De Morgan’s Laws (and all the rest of logic) appear. Logic is the basis of all mathematics, including set theory, and also of electronic circuit design. The accompanying illustration shows two more ways to state De Morgan’s Laws in these fields. In addition, it shows one further logical variation, called modal logic, which is extremely useful in analyzing natural language.

Modality (or mode, or mood) is a logical or semantic notion that appears, like negation and quantification, in every human language. Indeed, modality is intrinsically linked with negation and quantification, and has many complex interactions with them. The basic ideas behind modality are the concepts of possibility and necessity. Any word in a sentence that deals with these concepts in any way can be considered a modal term of some sort, and modal logic may be applied to propositions that contain it. In English, the set of modal terms (or just modals) includes the modal auxiliary verbs must, can, could, may, might, shall, should, will, would, and sometimes need and dare. It also includes adjectives like (im)possible, (im)probable, and (un)likely, and adverbs like maybe, possibly, probably, and perhaps.

Possibility and necessity are inverses of one another in exactly the same way that \( \exists \) and \( \forall \) are, and that \( \lor \) and \( \land \) are. If some proposition is necessarily true, then it is not possible for it to be false; likewise, if it is possibly true, then it is not necessary for it to be false. Modal logic uses the symbol \( \square \) (square) for necessary, and the symbol \( \Diamond \) (diamond) for possible. Thus, for any proposition \( p \), \( \square p \) means ‘\( p \) is necessarily true’ or just ‘\( p \) is necessary’, while \( \Diamond p \) means ‘\( p \) is possibly true’ or just ‘\( p \) is possible’. 
De Morgan’s Laws in modal logic use the reciprocal definitions of $\Box$ and $\Diamond$:

$\Diamond p \equiv \neg \Box \neg p$, and $\Box p \equiv \neg \Diamond \neg p$; or (respectively) if $p$ is possible, then it is not necessarily false, and if $p$ is necessary, then it is not possibly false. Possibility, looked at this way, means that $p$ is true in some set of circumstances, while necessity means that $p$ is true in all sets of circumstances. In other words, in the correct context, $\Box$ is equivalent to $\forall$ (and thus $\land$), while $\Diamond$ is equivalent to $\exists$ (and thus $\lor$). So $\Box$ and $\Diamond$ commute under negation in exactly the same way $\forall$ and $\exists$ do, which is exactly the same way $\land$ and $\lor$ do.

$\neg \Box p \equiv \Diamond \neg p \equiv \neg (\forall x) \neg p (x) \equiv (\exists x) \neg p (x) \equiv (p \land q) \equiv (\neg p \lor \neg q)$

$\neg \Diamond p \equiv \Box \neg p \equiv \neg (\exists x) \neg p (x) \equiv (\forall x) \neg p (x) \equiv (p \lor q) \equiv (\neg p \land \neg q)$

Recall that in many sentences the corresponding propositions have a large number of parentheses. For instance, a rather ordinary sentence like Bill wants to begin to learn to speak Spanish has the awkward associated proposition WANT (BILL, BEGIN (BILL, LEARN (BILL, SPEAK (BILL, SPANISH))))). This kind of detail makes a notation system too cumbersome to be of any use; if one is always having to match parentheses, there is no attention left to the novel conclusions that a calculus is supposed to produce. There are two different ways to solve this problem. Logic takes one and linguistics the other.

The logical solution is to do away with parentheses entirely, replacing them with a prefixal notation. Thus, instead of putting the functor $\forall$ between $p$ and $q$, as $p \lor q$, one might put it before them, as $\forall p q$. This is often called Polish notation or PVN, since it was originated by the Polish logician Jan Łukasiewicz (1878–1956), and most English speakers can neither spell nor pronounce his name (‘luke-skay-vitch’). A variant is reverse Polish notation or RPN, often used in programming languages (or Hewlett-Packard calculators), in which the functors (or in HP calculators, the arithmetic operation) is suffixal, following the arguments, as pqV. PN and RPN are completely equivalent, and either may easily be translated into the other. PN is still the most common logical variety.

In PN, each functor or operator is given a different letter (always upper-case, occasionally Greek) and its arguments are expressed in lower-case letters. PN formulas are read left-to-right, and no expression is complete until all its arguments are completely expressed. Thus no parentheses are needed. In Łukasiewicz notation, $\neg p$ is $Np$ ($N$ for Negativ – Łukasiewicz was writing in German); $p \land q$ is $Kpq$ ($K$ for Konjunktion); $p \lor q$ is $Apq$ ($A$ for Alternative); $p \equiv q$ is $Cpq$ ($C$ is a mnemonic for $\equiv$); $p \equiv q$ is $Epq$; $\Box p$ is $Mp$ ($M$ for Möglich); $\Diamond p$ is $Lp$ ($L$ for Logisch); $\forall x$ is $P{\cdot}x$, ($\exists x$) is $Sx$. Some equivalences are shown on the accompanying illustration of De Morgan’s Laws. Łukasiewicz notation works exactly the same as ‘standard’ notation (which is, roughly speaking, the notation used by Whitehead and Russell in their seminal work Principia Mathematica) in terms of truth tables and other logical niceties, but – since it does not require parentheses – it is much more machine-washable (since it is easily interpretable using only a simple pushdown stack) and finds much more favor in computational circles. For our purposes it is necessary only to be aware of it and be able if necessary to translate it into standard notation.

That is the logical solution to the problem of parentheses: change the notation to make the constituents easier to push around. The linguistic solution, on the other hand, is more concerned with making the data more easily accessible than with making the notation simpler, and thus it crucially takes note of the fact that the problem of parentheses
arises from trying to make everything appear on one line. Parentheses are nothing more than a way to represent two dimensions in one. That is, when we use multiple parentheses in WANT (BILL, LEAVE (MARY)), we are noting that the proposition LEAVE (MARY) is contained in (subordinate to, dependent on) the entire proposition (main clause, matrix sentence).

If we treat such predicational subordination as another dimension (say, the vertical dimension, which is after all the metaphor suggested by terms like dependent and subordinate), then we might get rid of the parentheses in WANT (BILL, LEAVE (MARY)) (at the cost of using more paper) by writing it in two dimensions, something like:

```
         WANT
           |
         BILL
           |
          LEAVE
           |
          MARY
```

This mode of representation is called a tree diagram, though clearly this is metaphorical also, since the ‘trees’ are upside down. Each node may have a label, producing a labelled tree, which looks like this:

```
         P
       /   |
      /    |
     WANT  BILL
     /
    LEAVE
   /   |
  MARY
```

where P designates Proposition. We could label the Predicate and Argument nodes as well, but the convention of putting the predicate to the left makes that unnecessary; in this case, for instance, it is clear that the lower, dependent, subordinate P serves as the second argument of the predicate WANT in the higher P; the order is the same as the order in the linear proposition WANT (BILL, LEAVE (MARY)). However, the parentheses and commas that are required to indicate the relations between the parts of the one-dimensional proposition are not needed in the two-dimensional diagram. In a proposition as simple as this, the difference between the two is small, but as the structures grow more complex, it is much easier to see the relationships among the parts of the structure.

Since propositions are logical structures modelling sentences (or clauses), it is common to use S instead of P to label propositions in such logical tree structures in linguistics. Either way, of course, the constituent structure of the proposition is made much more clear through such tree diagrams, and parentheses may be dispensed with. Tree diagrams are used, and much more highly elaborated, in grammatical analyses, but they are all based on the simple kind of predicate-and-argument diagram shown here.

There are many more logical details one could talk about, but mastering these is generally enough for anyone interested in English grammar. Attached are some diagrams and exercises covering the concepts discussed here.
De Morgan's Laws, as stated in various formal theories and notations

1. Set Theory
   The Complement of the Intersection of any number of sets is Equivalent to the Union of their Complements.
   \[ \overline{A \cap B} \equiv \overline{A} \cup \overline{B} \]
   The Complement of the Union of any number of sets is Equivalent to the Intersection of their Complements.
   \[ \overline{A \cup B} \equiv \overline{A} \cap \overline{B} \]

2. Circuit Diagrams
   A NAND gate is equivalent to an inversion followed by an OR.
   \[ \overline{A \cdot B} \equiv \overline{A} + \overline{B} \]
   A NOR gate is equivalent to an inversion followed by an AND.
   \[ \overline{A + B} \equiv \overline{A} \cdot \overline{B} \]

3. Propositional Calculus
   (Not (p And q)) is Equivalent to ((Not p) Or (Not q))
   \[ \neg(p \land q) \equiv (\neg p) \lor (\neg q) \]
   ‘Standard Notation’ (Principia Mathematica)
   
   ENKpqANpNq
   ‘Polish Notation’ (Łukasiewicz)
   
   (Not (p Or q)) is Equivalent to ((Not p) And (Not q))
   \[ \neg(p \lor q) \equiv (\neg p) \land (\neg q) \]
   PM
   ENApqKNpNq
   Łuk

4. Modal Logic
   (p is Not Necessary) is Equivalent to (Not p is Possible)
   \[ \neg \Box p \equiv \Diamond \neg p \]
   PM
   ENLpMNp
   Łuk
   
   (p is Not Possible) is Equivalent to (Not p is Necessary)
   \[ \neg \Diamond p \equiv \Box \neg p \]
   PM
   ENMpLNp
   Łuk

5. First-Order Quantified Predicate Calculus
   (Not (For Every x, \( \phi(x) \))) is Equivalent to (For Some x, Not \( \phi(x) \))
   \[ \neg(\forall x) \phi(x) \equiv (\exists x) \neg \phi(x) \]
   PM
   ENPxFxSxNphi
   Łuk
   
   (Not (For Some x, \( \phi(x) \))) is Equivalent to (For Every x, Not \( \phi(x) \))
   \[ \neg(\exists x) \phi(x) \equiv \forall (x) \neg \phi(x) \]
   PM
   ENSxFxPxnphi
   Łuk

This document is available on the Web at
http://www.anish.edu/~ihayek/logicguide.pdf
I. Grammatical Sentence                      Logical Proposition
1. Bill sings.                                SING (BILL)
2. Bill enjoys singing.                       ENJOY (BILL, SING (BILL))
3. Mary enjoys Bill’s singing.               ENJOY (MARY, SING (BILL))
4. Bill sings well.                           GOOD (SING (BILL))
5. Mary sees Bill.                            SEE (MARY, BILL)
6. Mary saw Bill.                             SEE (MARY, BILL) or PAST (SEE (MARY, BILL))
7. Bill is tired.                             TIRED (BILL)
8. Bill was tired.                            TIRED (BILL) or PAST (TIRED (BILL))
9. Bill sang a song.                          SING (BILL, SONG) or ...
10. Mary thinks that Bill is tired.           THINK (MARY, TIRED (BILL))
11. Mary wants to leave.                      WANT (MARY, LEAVE (MARY))
12. Mary wants Bill to leave.                 WANT (MARY, LEAVE (BILL))
13. Mary said that Bill was tired.            SAY (MARY, TIRED (BILL))
14. Mary told Bill that she was tired.        TELL (MARY, BILL, TIRED (MARY))
15. Mary told Bill that he was tired.         TELL (MARY, BILL, TIRED (BILL))
16. Mary told Bill to leave.                  TELL (MARY, BILL, LEAVE (BILL))
17. Mary thought that the man was tired.      PAST (THINK (MARY, TIRED (MAN)))
18. Mary thinks that Bill left.               THINK (MARY, PAST (LEAVE (BILL)))
19. Mary said that Bill had left.             PAST (SAY (MARY, PAST (LEAVE (BILL))))
20. Mary told Frank that Bill had left.       PAST (TELL (MARY, FRANK, PAST (LEAVE (BILL))))

Above are twenty English sentences with their corresponding propositions expressed in Predicate Calculus. Note the Predicate (Arguments) notation.

Find or create twenty more sentences of approximately equal complexity and give their corresponding propositions. You will have to determine which terms are predicates, and which other terms are their arguments. Note that not all logical arguments are expressed – compare (2) and (3), for instance.

Since logic ignores articles, as well as person, number, and tense, you may do so also whenever it is not relevant to the exposition. For example, in (17-20) tense is relevant, and is therefore indicated, but since there is no basic propositional difference between (7) and (8), tense can be profitably ignored.

Hints: (a) Don’t forget to balance parentheses,
(b) Avoid quantifiers like all or some; they appear in Exercise 2.
II. Express in both 'Standard' and 'Polish' notation the following propositions. For each, special peculiarities and instructions are appended.

1. *All the boys don't speak Spanish.*
   NB: Since this is ambiguous, it will need two expressions, one for each sense.

2. *Bill may not like logic, but he can't ignore it.*
   NB: Treat *but* as equivalent to *And*, and both *may* and *can* as *Possible*.

3. *If you build it, they will come.*
   NB: Ignore tense.

4. *Nobody likes a wise guy.*
   NB: Treat *a wise guy* as an existential quantifier,
   e.g., 'Some *x* such that *WISE-GUY (x)*';
   be careful with the placement of the quantifiers and the negative.

5. *You can fool all of the people some of the time,*
   *and some of the people all of the time.*
   NB: Treat *fool* as a 3-place predicate with a time argument,
   e.g., *FOOL (YOU, x, t)* means 'You fool *x* at time *t*'.

6. *'Oh, life is a glorious cycle of song,*
   *A medley of extemporanea;* 
   *And love is a thing that can never go wrong,*
   *And I am Marie of Roumania.*
   — Dorothy Parker (1893-1967)
   NB: Treat the predicates as single items (e.g., *MARIE-OF-ROUMANIA (I)*), and adjacent propositions without conjunctions as if connected by *And*.
   Comment on the truth values of the individual conjuncts.

7. *If that answer's correct, then I'm a monkey's uncle.*
   NB: Treat the predicates as single items, and comment on the truth value of the proposition as a whole. How does the Contrapositive Law apply here?

8. *He has to be either here or there, but he's not here.*
   NB: Treat *but* as *And*, and comment on the conclusion to be drawn.

9. *Though everybody likes Raymond, not everybody likes his mother.*
   NB: Treat *though* as *And*. Is order of conjoined propositions significant?

10. *Buy today and get 0% interest.*
    NB: Expand this sentence by supplying missing arguments before logicizing it; some of them are indefinite, to be supplied by context, and therefore not a problem for logic. Be careful of the *and*: it doesn't really represent logical *And*, but rather a different functor. Which one? Is this an imperative?
### Some Types of Predicate

<table>
<thead>
<tr>
<th>Factive predicates</th>
<th>realize, remember, (be) delighted (that S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterfactual predicates</td>
<td>pretend (to)</td>
</tr>
</tbody>
</table>

**Factive predicates** presuppose their complements; **counterfactual predicates** presuppose the falsity of their complements. The principal test for presupposition is the negation test: If P presupposes P, then S entails P (S → P), and so does ¬S, the negation of S (¬S → P).

- Bill is pleased that it rained today. ⇒ It rained today.
- Bill is not pleased that it rained today. ⇒ It did not rain today.

**Implicative predicates** entail the truth of their complements, and their negations entail the falsity of their complements. The signs are reversed with **Neg-implicative predicates**:

- Bill managed to open the door. ⇒ Bill opened the door.
- Bill didn't manage to open the door. ⇒ Bill didn't open the door.
- Bill failed to open the door. ⇒ Bill didn't open the door.
- Bill didn't fail to open the door. ⇒ Bill opened the door.

**If predicates** express a sufficient condition; **only-if predicates** express a necessary condition.

- Jim forced Bill to open the door. ⇒ Bill opened the door.
- Jim didn't force Bill to open the door. ⇒ Bill didn't open the door.
- Jim prevented Bill from opening the door. ⇒ Bill didn't open the door.
- Jim didn't prevent Bill from opening the door. ⇒ Bill opened the door.
- Bill had the courage to open the door. ⇒ Bill opened the door.
- Bill didn't have the courage to open the door. ⇒ Bill didn't open the door.

**Inchoative predicates** express a change of state, from an action to a state, from a state to an action, or from one state to another. **Causative predicates** express the cause of some change. It is common to use the same verb for both causative and inchoative. Causatives typically entail an inchoative representing the change; inchoatives typically entail the end state.

- Bill opened the door. ⇒ The door opened. ⇒ The door was open.
- Driven made Bill tired. ⇒ Bill got tired. ⇒ Bill was tired.
- Frau taught Bill to drive a diesel. ⇒ Bill learned to drive a diesel. ⇒ Bill can drive a diesel.
- Bill killed the cat. ⇒ The cat died. ⇒ The cat is dead.

**Stative**

- own, believe, know; (be) dead, tall, closed, open, ripe

**Active**

- action
  - rent, run, (be) honest, paint
- achievement
  - arrive, leave, start, finish
- accomplishment
  - climb the mountain, paint the wall

**Stative predicates** express a state; they cannot be used in the progressive or imperative, or with Action do.

**Active predicates** may express an action (durative and indeterminate as to end state), an achievement (punctual, representing an end state only), or an accomplishment (durative and equivalent to an action plus its terminal achievement). Durative actions can occur in the progressive, and volitional ones in the imperative. Both adjectives and verbs may be either active or stative.

- Rent/*Own that house, please.
- Be honest/*talk for a moment.
- Bill walked/*for in a few hours.
- Bill stopped/*arriving at 3.
- What he did was rent/*own it.
- What he did was be honest/*talk.
- Bill arrived/*for in a few hours.
- Bill stopped/*arriving at 3.

**Bill** is renting/*owning a house on the West Side.

**Bill** is being honest/*talking.

**Bill** climbed the mountain/*for in a few hours.

**Bill** stopped/*arriving at 3.
In the Logic Study Guide, we ended with a logical tree diagram for WANT (BILL, LEAVE (MARY)), in both unlabelled:

```
   WANT
      |
   BILL
     |   |   |
  LEAVE MARY
```

and labelled versions:

```
P

   WANT
      | |
   BILL
     |   |   |
  LEAVE MARY
```

We remarked that one could label the Predicate and Argument nodes as well, and that it was common to use $S$ instead of $P$ to label propositions in such logical tree structures in linguistics. It is also common, in practice, to use $V$ to label Predicates, and $N$ (or $NP$, standing for Noun Phrase) to label Arguments. This would produce the following diagram:

```
   S
     ^
    V  NP  NP
       \
      WANT BILL

   S
     ^
    V  NP
       \
      LEAVE MARY
```

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```
   S
     ^
    V  NP  NP
       \
      WANT BILL

   S
     ^
    V  NP
       \
      LEAVE MARY
```

Note that, while these two predicates are in fact verbs, and the arguments are nouns, that's not always the case, and one may use $V$ loosely to label any Predicate node, whatever its syntactic class might be. This kind of structural description, intermediate between logic and surface syntax, is called a **deep structure**; we say this diagram represents the deep structure of *Bill wants Mary to leave*. Roughly speaking, deep structures are intended to represent the meaning of the sentence, stripped to its essentials. The deep structures are then related to the actual sentence by a series of relational rules.

For instance, one such rule is that in English, there must be a subject $NP$, and it precedes the verb, instead of coming after it, as here. So we relate this structure with the following one by a rule of **Subject Formation**, which applies to every deep structure towards the end of the **derivation** (the series of rule applications; a number of other rules would have already applied earlier, producing the other differences). In the diagram above, the effect of Subject Formation is indicated by the curved arrows; it moves the first argument of each clause up and out of the clause, forming a new constituent:
Subject Formation takes the first (Subject) argument NP following the V and moves it up to hang from the S node, leaving behind what remains of the initial S. The original S node is left unlabelled in this diagram, as is the original S node that remains downstairs after applying Subject Formation to the infinitive. What should we call these nodes? They're not Sentences any more; they're sentences that have lost their subject. They are constituents of the sentence, though, and since they are always headed by a V, they are traditionally labelled Verb Phrase, or VP. Adding these labels leads to the following diagram, which is called a Phrase-Marker, or the Surface Structure:

It's important to note that a derivation like this (of which we have seen here only the last step) is not intended to represent what goes on in a speaker’s mind when they say the sentence; rather, it’s just an abstract model, a way to keep the intermediate structures sorted out and to label the various stages in the chain of structures between the meaning, or deep structure, and the syntax, or surface structure.

The metaphor used here is as if the deep structure (the meaning) rises out of the depths of the mind like a sea monster, and transforms itself gradually as it rises, until it becomes something that can survive in the air, namely an actual piece of language, the surface structure, transformed from a chunk of thought and meaning. As Shakespeare put it, in a rather different context, ‘It has suffered a sea change / Into something rich and strange.’
This is why this kind of grammatical model is often called *transformational grammar*; the individual rules that relate stages of a derivation are sometimes called *transformations*, though we will simply call them *rules*. There are lots of different rules, and different kinds of rules, but since rules are abstractions and we are concerned here with data analysis, we will mostly pay attention to the structures that provide evidence for the rules, which are called, simply, *constructions*. All syntax depends on constructions; every language has thousands of constructions, some common, some rare, and every variety in between. In English, the two most common constructions are the NP and the VP, which together make up every S; in fact, the basic structure of an English sentence is simply NP – VP. Both of these constructions have internal structure (that’s why they’re called *constructions*), and several different parts that have to come together in just the right way, ordinarily in just the right order.

*Verb Phrases* are the more important and the more complex of the two construction types. The predicate in a clause determines almost everything else in the clause – what can be the subject, whether there is a direct or indirect object and what kind of noun can function as either, what kinds of constructions can be used in the clause, what prepositions and adverbs can be used, what auxiliary verbs can be used, and so on. The predicate (which is usually a verb, and almost always includes some verb in its VP, even if it’s only an auxiliary like *be*) is the head of the VP and of the clause as a whole. No verb, no clause. At least, not in English. As I like to put it, verbs have more fun.

*Noun Phrases*, by contrast with VPs, are static and subordinate. Verbs are the type of word *par excellence* that indicates action, motion, and continuity in time; the German word for ‘verb’ is *Zeitwort*, which means ‘time word’. The old saw still taught to children in school is that “a noun is the name of a person, place, or thing”, while “a verb denotes action, being, or state of being”. These definitions are precisely backward. It is not true that all nouns or all verbs mean these kinds of things; but it is true that persons, places, and things are denoted by nouns, while action, being and state of being are denoted by verbs. The problem with definitions like this is that they appeal to meaning instead of grammar to define grammatical categories.

For our purposes, we will call anything a *verb* that one can use in the present or past tense (technically, we say they *take tense inflections*), and we will call anything a *noun* for which one can substitute a personal pronoun (*he, she, him, her, it*) without change in meaning. These are not perfect definitions, but they do have the advantage of being testable by any native speaker in the syntax lab, instead of requiring one to distinguish, for instance, whether *love* is a person, a place, or a thing, or whether *live* denotes ‘action’, ‘being’, or ‘state of being’.

The rest of this study guide is about VPs. *Verb Phrases*, being clauses (sentences) without a subject, normally begin with a *Verb* node on the left. More often than not, this initial verb is an *auxiliary verb*. Auxiliaries fall into several categories; English is changing and one of the most obvious changes of the last few centuries has been the multiplication of auxiliary verb group constructions. However, there are four canonical categories of auxiliary that can occur, alone or together, in an auxiliary verb chain, before the main verb of a verb phrase; each must be followed by a particular form of the next verb, whether that next verb is the main verb or another auxiliary verb in the chain.

In their order of appearance, these are:

1. **Modal Auxiliary Verbs**: *may, might, can, could, shall, should, will, would, must*. Modal auxiliaries must be followed by an **infinitive** verb form.

   *Bill might be here. Mary can go now.*

   (*be* and *go* are infinitive verb forms)

   [for more about modal auxiliary verbs, see [http://www.yorku.ca/~jayler/are_modals.html]]
VP Study Guide

2. have, the Perfect auxiliary; have must be followed by a past participle verb form
   Bill has sung already. Bill might have left already.
   (sung and left are past participle verb forms; the have in might have is an infinitive)

3. be, the Progressive auxiliary; this be must be followed by a present participle form
   Bill is leaving now. Mary has been driving the car. Bill might have been sleeping.
   (leaving, driving, and sleeping are present participles; been is a past participle)

4. be, the Passive auxiliary; this be must be followed by a past participle form
   Bill was seen with Mary. Bill has been seen with Mary.
   Bill has been being seen with Mary since January.
   Bill might have been being seen with Mary even before then.
   Bill is not being seen with Mary these days.
   Bill might be seen with Mary again soon.

Note that there are two different auxiliary uses of be: the progressive, which follows it with a present participle, and the passive, which follows it with a past participle. It is the form of the following verb that we use to tell the difference between the two constructions. Passive is a little different from the other auxiliaries – there are other considerations in the passive beyond the auxiliary and verb form. Passive is a rule that relaes an transitive active sentence with an intransitive passive sentence, in which, besides the use of auxiliary be followed by the past participle of the main verb, the active direct object becomes the passive subject, the active subject shows up in the passive, if at all, in a prepositional phrase with by, and there is no change in meaning despite these massive changes in structure:

   The Acme Construction Co. erected this building in 1980.
   Passive ↔ This building was erected by the Acme Construction Co. in 1980.

These canonical auxiliary verbs must occur in the order specified, and each must be followed by the correct form of the next verb in sequence. The first verb in the verb phrase of a main clause must be marked for tense – i.e., it must be either present or past tense; this applies to main verbs if there are no auxiliaries, or to the first auxiliary if there are. (Except for modal auxiliary verbs, which have no tense markings (they are called defective verbs because they lack these tense forms, as well as participles and infinitives); as we will see, modal auxiliaries are exceptional in practically every way.) In all the examples above, the first auxiliary verb (the un-underlined verb) was either present tense or past tense, or a modal auxiliary.

This first auxiliary verb position is a very important one in English, since many syntactic rules require something to happen to the first auxiliary verb, and may require there to be a first auxiliary verb even if the sentence doesn’t have one. Consider what happens when sentences with auxiliary verbs in them get used with a negative, or get formed into a yes/no question (i.e, a question that can be answered with yes or no; there are several other kinds of question):

   Bill was living on Elm Street.
   (progressive auxiliary verb was in past tense; present participle living)

   Negative ↔ Bill wasn’t living on Elm Street.
   (past tense auxiliary was takes negative)

   Question ↔ Was Bill living on Elm Street?
   (auxiliary was inverted for question)
Bill has been living on Elm Street.
(perfect auxiliary verb has in present tense)

Negative ↔ Bill hasn’t been living on Elm Street.
(present tense auxiliary has takes negative)

Question ↔ Has Bill been living on Elm Street?
(auxiliary has inverted for question)

Consider, by contrast, what happens when there is no auxiliary verb:

Bill lives on Elm Street.
(no auxiliary verb; main verb lives in present tense)

Negative ↔ Bill doesn’t live on Elm Street.
(auxiliary does in present tense takes negative, with infinitive live)

Question ↔ Does Bill live on Elm Street?
(inverted present tense does required for question, with infinitive live)

Where did the does come from above? In both cases, it is inserted by a rule which requires the presence of at least one auxiliary verb in the VP: respectively, the rules of Negative Formation (which requires that a negative word come after the first auxiliary verb), and of Yes/No Question Formation (which requires that the first auxiliary verb appear inverted, before the subject, at the beginning of a yes/no question). This process is called Do-Support, the basic idea is that sometimes an auxiliary verb is required, and if so, a present or past form of do is supplied, free of charge.

Do-support do (there are several other kinds of auxiliary do constructions; do-support do is the most common), like a modal auxiliary, must be followed by an infinitive form of the main verb, unlike a modal, however, it is inflected for present or past tense. Do-support do has no meaning, and there is no meaning change in a sentence from do-support. Since do-support only occurs in cases where there are no other auxiliaries, this auxiliary do never occurs in the multiple sequences of the other (Modal, have, and be) auxiliaries discussed above; it’s a parallel construction.

A question arises about how such constructions as auxiliary verbs and verb chains ought to be represented in tree diagrams. There are several ways to handle these, but the simplest one, which we will use, is to simply treat each verb as the head of its own VP node, so that in Bill must have been being seen by Mary the auxiliary verb chain would have the tree structure:

```
S
   VP
      Bill
         must
              VP
                 been
                     VP
                            PP
                                   by
                                           Mary
```

In principle, there is only one VP per S, but clauses can be broken up and merged with one another by a number of processes, and the construction of auxiliary verbs and verb chains is one such. These verbs may be on the way to becoming verbal prefixes; in generations, auxiliaries often get reduced and attached to the words they modify, until all that is left is a suffix (from auxiliaries that follow) or prefix (from those that precede). This is the origin, for instance, of the future tense in French and Spanish.
VP Study Guide

There are many, many other auxiliary constructions in English besides do-support and canonical verb chains. Here is a list of some VP constructions that everybody is familiar with; there are plenty more, many with special pronunciations that are unique to the construction:

I had to go ................................................. /ayhârâgo/
I used to go ................................................. /ayûstâgo/
I am used to going ......................................... /amûstätagowân/
I used to be used to going ......................... /ayûstâbiyûstätagowân/
I am going to be used to going ................... /amgûnâbiyûstätagowân/
I was going to go ........................................ /awyzgûnâgo ~ awyzgûwânâgo/
I might have had to go ................................. /aymûyrahâdtago/
I had been going to go ................................. /aydhûngûwanâgo/
I might have been going to go .................... /aymûyraâbûngûwanâgo/
I had had to go .......................................... /aydhûdtâgo/
I used to have to go ..................................... /ayûstûhûfâtago/
I was going to have to go .............................. /awyzgûnâhûfâtago/
I have got to go ......................................... /aygûrago/
I want to go .............................................. /aywûnago/
I don’t want to go ....................................... /aûwûnago/
I have got to want to go .............................. /aygûrawûnago/
I ought to go ............................................. /ayûrâgo/
I ought to want to go ................................... /ayûrawûnago/
...etc.

These come from several different sources (some of which are preserved in the way they’re written), and they have different meanings and uses, and they’re at several different stages on the road from independent clause to auxiliary construction; but they illustrate just how complex VP constructions have become in English.

As an exercise, try to isolate each construction that appears in the list above, give it a name (e.g. the have to construction), mention any oddities about its pronunciation, and indicate what it means, what must follow it, and what it can combine with.

We will return to these constructions presently; for now, let us consider what else is in the VP besides the main verb and its auxiliaries. One thing is the direct object and another is the indirect object; these are the non-subject arguments of transitive and ditransitive predicates. Everybody knows there’s a difference between the subject and the objects, but few can articulate these differences. That’s not surprising, because there is no consistent relation between the subject and the object per se, but rather there are relations between the subject and the verb, and between the object(s) and the verb. Some of these relationships are reasonably regular and predictable: subjects of verbs that denote actions tend to be agents of those actions, while subjects of predicates denoting states tend to be experiencers of those states. Indirect objects of ditransitive verbs, which ordinarily refer to an event of transfer, are goal of transferred things, which show up as direct objects, while the subject is the agent and source.

But the relationship between a transitive predicate and its direct object varies significantly, depending on the nature of the predicate. About the only generalization that can be made is that the direct object is ordinarily affected by whatever the predicate refers to. Thus the direct object of a verb denoting a bodily action like kick, hit, or touch refers to the target of the action by the subject, while the direct object of a verb denoting a sensation like see, fear, or learn refers to something that causes the sensation in the subject; each individual verb has its own individual relation with its object(s).
For example, consider the different roles that the ball plays in the following:

- Bill kicked the ball. [affected patient]
- Bill made the ball. [created thing]
- Bill saw the ball. [sensory percept]
- Bill mentioned the ball. [conceptual topic]
- Bill remembered the ball. [experiential percept]
- Bill feared the ball. [emotional percept]
- Bill wanted the ball. [motivational goal]

In these sentences (and it would be easy to go on for many, many more) the ball sometimes refers to a physical object, sometimes to the sensory image of a physical object, and sometimes to an abstract mental concept. Each of these is further qualified by how it is affected or how it is related to the subject by virtue of the meaning of the verb. The precise nature of the relation of direct object is determined by the verb; in effect, it is part of the meaning of the verb. It is for this reason that the direct object is considered part of the Verb Phrase, while the subject is not. In terms of the tree structure, this is shown by the independent status of the subject NP, directly under the S node, while the object NP is directly under the VP node.

As an exercise, construct another dozen sentences like those above, using other possible objects, like personal names, collective nouns, or place names. What other kinds of direct object relation can you find? Try to construct pairs of sentences with the same kind of direct object; in such cases, what can you say about the pair of verbs involved?

The direct object NP usually follows the main verb, which is at the end of the auxiliary verb chain. The object and the main verb are very tightly bound; even words like adverbs that can go almost anywhere in the sentence can't come between the main verb and the direct object:

- Yesterday Bill kicked the ball.
- Bill rarely kicked the ball.
- Bill kicked the ball savagely.
- *Bill kicked yesterday the ball.
- *Bill kicked rarely the ball.
- *Bill kicked savagely the ball.

(Incidentally, the convention in syntax is to mark ungrammatical sentences with an asterisk, like the last three sentences above; this is done to demonstrate when application of a rule to a given construction is not allowed. Creating sentences by application of rules is part of studying grammar, and it is important to be able to tell where rules apply and where they don't; hence the convention of generating — but marking — ungrammatical sentences.)

The other argument that sometimes occurs in the VP is the indirect object. Indirect objects can only occur with ditransitive predicates, just as direct objects can only occur with transitive predicates. Ditransitive predicates, as noted before, all refer to some kind of transfer, either physical (I tossed the ball to Bill) or communicational (I told the story to Bill), of a trajector (denoted by the direct object) from a source (denoted by the subject) to a goal (denoted by the indirect object). It is almost always the case that the indirect object in a clause refers to a person, since most verbs of transfer refer to transfers between people.
VP Study Guide

Indirect objects can occur with direct objects in two different constructions. One puts the
direct object before the indirect object, and marks the indirect object with the preposition to; the
other puts the direct object after the indirect object, and just uses the two noun phrases:

I tossed the ball to Bill. ~ I tossed Bill the ball.
I told the story to Bill. ~ I told Bill the story.

This is an example of an alternation; that is, a systematic relation between two different
constructions that mean the same thing. We say these two constructions alternate — one can use ei-
er. Alternations are always governed by a verb — in this case, they are governed by all (or almost
all) bitransitive verbs — which means that it is the verb, and the type of verb, that determines
whether the alternation is possible. An alternation can define a rule that changes one of the con-
structions into the other; this particular alternation is called the Dative Alternation, and the rule that
changes the first construction into the second is variously called Dative, Dative Movement, or Goal
Advancement.

(This is probably a good place to point out that there are many, many theories of syntax that are called
generative by various people. They have proliferated since the original advent of generative gram-
mar in 1956, and now, after a half-century of heresy and schism, they constitute a mutually incom-
patible and totally incomprehensible spectrum of terms, rules, axioms, claims, and counterclai-
ms. Since our purpose is to describe and explain English grammar, using only terminology necessary to
describe the phenomena we are considering, we will ignore most of them here. I mention alternative
terms only to show that they refer to the same phenomena.)

Since both versions of the Dative alternation mean the same thing, it's important to note that
the goal NP in both cases can be called the indirect object; its position doesn't change its grammati-
cal role. However, this does pose a problem for our tree structures, since one or the other order of
direct and indirect object ought to be chosen as the basic one, just to be consistent. Consequently,
we will somewhat arbitrarily choose the first order — the one with to — as the basic one, thus
denoting the structures of both transitive and bitransitive clauses with the direct object immediately
following the main verb. The indirect object will then follow the direct object, thus:

\[ S \]
\[ NP \quad VP \]
\[ Bill \quad V \quad NP \]
\[ tossed \quad the \quad ball \]
Transitive Sentence

\[ S \]
\[ NP \quad VP \]
\[ Bill \quad V \quad NP_1 \quad NP_2 \]
\[ tossed \quad the \quad ball \quad to \quad Mary \]
Bitransitive Sentence

Dative Movement

Note that the indirect object node in the tree diagram on the right is marked as \( NP_2 \), even
though it is obviously a prepositional phrase (PP). \( PP \) would be one acceptable label for this node, but
I have chosen to label it as an \( NP \) for two reasons: (1) it functions as an \( NP \), the indirect object of the
clause, and (2) the preposition \( to \) disappears under the Dative alternation. Labelling it as a \( PP \) would
draw attention to the preposition, which is dispensable, instead of the grammatical relation of indirect
object \( NP \). The purpose of tree diagrams is to point out the important relations, rather than to be some
kind of complete accounting of all the minor details. In general, prepositional phrases in English
mostly function as (specially-marked) \( NPs \), and we will often simply call them \( NPs \). Under this analy-
ysis, then, Dative movement simply deletes the preposition \( to \) from \( NP_2 \) (indicated by the Zero marker
\( \{ \} \)) and exchanges the positions of \( NP_1 \) and \( NP_2 \) (indicated by the double-headed arrow).
We now have a conventional representation for all three arguments of a proposition. Recall that there are never more than three: subject, direct object, indirect object. Every sentence has a subject in English, transitive sentences have direct objects as well, and ditransitive sentences have both subject and direct object, plus an indirect object, all portraying transfer of some real or abstract trajector from source to goal. These three categories of NPs in a clause are called grammatical relations, to distinguish them from all other uses of NPs, like apposition or object of preposition; indeed, some syntactic theories, like Relational Grammar, simply call Subject, Direct Object, and Indirect Object 1, 2, and 3, respectively, because they are considered so basic.

Ramifications of this scheme fall into two categories: (a) other parts of the VP, that don’t bear grammatical relations, and (b) extensions of one of the grammatical relations, such as having a clause instead of a simple NP as the subject or direct object. We will deal with category (b) in a separate study guide on Complements. Here we will take up category (a), which largely consists of adverbials.

Adverbs have long been called a ‘wastebasket’ category in syntax. Their definition is very general: adverbs are distinguished from adjectives—which modify nouns—by saying they ‘modify verbs, adjectives, or other adverbs’; to this one can add that they modify phrases and clauses as a whole. If something doesn’t fit nicely in some other word class, it generally gets lumped in as an adverb of some sort. Traditionally, adverbs (and adverbials, which means ‘any chunk that acts like an adverb’—not a terribly precise definition) represent qualifications and afterthoughts to ordinary propositions. If an clause, for instance, describes an event (the prototype situation), then that event must have taken place at some time, in some place, and under some circumstances; these may or may not be mentioned in the clause, and they may or may not be important to understanding it. If they are, then one may use some kind of adverb or adverbial to denote them.

Besides these essential adverbials, which in principle may be added to any sentence to describe place, time, or circumstance, there are also specific adverbials that describe other, special, kinds of qualifications that are not part of any and every event. One of the differences between the two kinds of adverbials is what happens to them with negation. If the adverbial is not essential, but rather specific, then negating it doesn’t negate the whole sentence, and fronting the negative adverbial doesn’t govern subject-verb inversion:

- I didn’t make that for any reason. ~ *For no reason did I make that.
- I didn’t make that in any manner. ~ *In no manner did I make that.
- I didn’t make that with any instrument. ~ *With no instrument did I make that.

However, if the adverbial is essential, then negating it does serve to negate the whole sentence, and fronting the negative adverbial does govern subject-verb inversion:

- I didn’t make that at any time. ~ At no time did I make that. ~ Never did I make that.
- I didn’t make that at any place. ~ At no place did I make that. ~ Nowhere did I make that.
- I didn’t make that in any way. ~ In no way did I make that. ~ No way did I make that.
- I didn’t make that under any circumstances. ~ Under no circumstances did I make that.

Both of these kinds of adverbials can be considered constituents of the VP. Their placement in the tree structure is somewhat arbitrary, since they may in fact occur in a number of positions in the actual sentence. However, all of them do often occur at the end of the sentence—as afterthoughts, usually—and that is a traditional place to put them in diagrams, treating other positions as derived by movement rules. Since adverbs are largely unplumbed mysteries in English grammar, this solution will do as well as any other for our purposes.
The English Verb Phrase

1. They watch us.  
2. They are watching us.  
3. They have watched us.  
4. They might watch us.  
5. They will watch us.  
6. They might be watching us.  
7. We are watched (by them).  
8. We will be watched (n).  
9. We have been watched (n).  
10. We will have been watched (n).  
11. They watched us.  
12. They were watching us.  
13. They had watched us.  
14. They might have watched us.  
15. They will have watched us.  
16. They may have been watching us.  
17. We were watched (by them).  
18. We could have been watched (n).  
19. We had been watched (n).  
20. We would have been watched (n).  
21. We must have been being watched (by them).

a. Where does the present or past tense morpheme go? State the rule.

b. How do you form a question answerable by "yes" or "no" for each of the statements above? State the rule.

c. If you wanted to put a not into each of the sentences above, how would the sentence look? State the rule.


e. What happens if you change the order of any of the auxiliaries above? Are there any other words that might substitute for any of them?

English Reflexives

1) I shave myself.  
2) *You shave yourself.  
3) He shaves himself.  
4) We shave ourselves.  
5) You shave yourselves.  
6) They shave themselves.  
7) *I shave yourself.  
8) *You shave myself.  
9) *He shaves yourself.  
10) *We shave yourselves.  
11) *You shave ourselves.  
12) *They shave yourselves.  
13) Shave yourself.  
14) Shave yourselves.  
15) *Shave myself.  
16) *Shave himself.  
17) I want you to shave yourself.  
18) *I want you to shave myself.  
19) I expect that I can shave myself.  
20) I expect to shave myself.  
21) I want to shave myself.  
22) Bill wants to shave himself.  
23) I want Bill to shave him.  
24) I want Bill to shave himself.  
25) Bill wants to shave him.  
26) Bill wants to shave himself.
Equi-NP-Deletion vs Subject Raising
(Subject or Object Infinitive Complements only)

2-Place Equi (e.g. want, try, eager)
Upstairs Subject coreferential to
Downstairs Subject (deleted)

3-Place Equi (e.g. tell, order, make)
Upstairs (Indirect) Object coreferential to
Downstairs Subject (deleted)

1-Place Raising (e.g. seem, appear)
Downstairs Subject Raised to become
Upstairs Subject (aka A-Raising,
Raising to Subject)

2-Place Raising (e.g. want, believe, consider)
Downstairs Subject Raised to become
Upstairs Object (aka B-Raising,
Raising to Object)
The Cliff's on Equi and Raising

Equi (short for Equivalent Noun Phrase Deletion) and Raising (short for Subject Raising) are two syntactic rules (aka processes, transformations, or alternations) that relate sentence structures. There are hundreds of such rules in every language, of many types.

Equi and Raising are both governed cyclic rules. A governed rule is one that may only apply if there is a particular verb as the main verb in the clause it applies to. A cyclic rule is one that may only apply in a single clause, but may be applied repeatedly in subordinate clauses. Governed cyclic rules constitute a major type of syntactic rule; cyclic rules tend to be governed, and vice versa.

Equi and Raising are important rules of English:

- because they help to categorize verb classes — one often speaks of 'Raising verbs' or 'Equi verbs', for instance, as a shorthand for the class of verbs that govern one or the other process.
- because they're very common in use; that is, there are a lot of Equi verbs and Raising verbs, so it's a major classification.
- because they both produce the same kind of structures — sentences that look alike — from different initial structures, so they're easy to confuse and they require special tests to distinguish.

Both rules apply to complement clauses. Complements are noun clauses — subordinate clauses that function as the subject or the direct object of particular verbs. There are four types of complements in English, each of which can occur either as subject or as object, depending on the main verb:

- Two finite types, which must contain a verb in the present or past tense:
  - that clauses, which start with that (often deleted)
    Subj: That he practiced the tuba at 3 AM surprised me.
    Obj: I think that he practiced the tuba at 3 AM.
  - embedded questions, which start with a wh-word
    Subj: Why he practiced the tuba at 3 AM surprised me.
    Obj: I know why he practiced the tuba at 3 AM.

- Two non-finite types, which contain verb forms that don't take present or past tense endings:
  - gerund clauses, which use the -ing form of the verb:
    Subj: His practicing the tuba at 3 AM annoyed me.
    Obj: I protested his practicing the tuba at 3 AM.
  - infinitive clauses, which use the root form of the verb and usually (but not always) precede it with to.
    Subj: For him to practice the tuba at 3 AM would annoy me.
    Obj: She forbade him to practice the tuba at 3 AM.

Of these types, infinitives are by far the most complex, occur in the most constructions, and participate in the most rules. Equi and Raising both apply to infinitive complements; Equi also applies to gerund complements, but there it can't be confused with Raising, since Raising is restricted to infinitive complements.

(Other rules that can apply to infinitives include Extrposition, which moves the infinitive phrase to the end of the sentence and leaves it behind as subject in the main clause.)
The Cliff’s on Equi and Raising

It’s easy (for him) to practice the tuba.

and Tough-Movement, which raises the Object of the complement clause to become subject of the main clause:

The tuba is easy (for him) to practice.

Both Equi and Raising have the effect of reducing an infinitive complement clause to a simpler nonclausal structure (normally appearing at the end of the sentence). Such reductions can’t occur with finite clauses, only non-finite ones; consequently neither Equi nor Raising applies to finite complements like that clauses or embedded questions.

Both Equi and Raising occur in two versions, called A and B. We will be concerned here with the A configuration, since the arguments and tests work the same way for the B configuration. So, from now on, unless otherwise noted, Raising refers to A-Raising.

• A-Raising occurs with Subject complements and raises the subject of that complement to be the subject of the main clause, moving the infinitive phrase that’s left to the end of the main clause:

For Bill to leave early is likely. → Bill is likely to leave early.

Most verbs that govern Raising with infinitive subject complements require it, since they tend to be verbs that frame some predicate in the complement and don’t have much meaning by themselves, e.g. seem, appear, tend, fail, happen, start, turn out. These verbs don’t sound right when they appear at the end of a sentence, and the impulse is to put something after them, an effect that Raising produces:

*For Bill to enjoy the play seemed. → Bill seemed to enjoy the play.
*For Bill to enjoy the play appeared. → Bill appeared to enjoy the play.
*For Bill to be late tends. → Bill tends to be late.
*For Bill to attend the meeting failed. → Bill failed to attend the meeting.
*For there to be an accident happened. → There happened to be an accident.
*For it to snow started. → It started to snow.
*For Bill to be the winner turned out. → Bill turned out to be the winner.

Notice that A-Raised sentences have the structure

Subject - Verb - to - Infinitive phrase

This is the A Configuration, produced both by A-Raising and by A-Equi.

• A-Equi deletes the subject of an Object complement because it's identical with the subject of the main clause. That is, there are really two references to a given noun in an Equi sentence; one as the subject of the main clause; and one as the subject of the subordinate (complement) clause, even though only one appears in the actual sentence. Conventionally, we say that the one in the subordinate clause is deleted (there are other ways of dealing with this fact, but this is the way Equi views it).

So, in an Equi sentence like

Bill wants to leave at noon.

Bill is the subject of want, therefore referring to the person doing the wanting, and also is the subject of the complement infinitive to leave, therefore referring also to the person doing the leaving. This is not the case with Raising; a Raised subject of a Raising verb does not really have an independent relation with that verb; i.e., in
The Cliff's on Equi and Raising

The casserole seems to be done.

the casserole is clearly the thing that is done (subject of the complement to be done), but it's just as clearly not the thing that is doing the seeming. Seeming isn't an activity or state that can happen independently. So there's only one instance of that noun phrase in an Raised sentence, which originates as the subject of the complement infinitive, but shows up on the surface as the subject of the Raising verb.

That's the basic difference between Raising and Equi:

o 2 identical subject nouns in an Equi sentence,

one upstairs in the main clause, and another downstairs in the object complement;

[Bill, wants [(for) Bill] to leave at noon]]

Equi deletes the one downstairs,

leaving only the infinitive at the end.

[Bill, wants [_, to leave at noon]]

o 1 (and only 1) subject noun in a Raising sentence,

downstairs in the subject complement;

[[(For the casserole) to be done] seems]

Raising moves it upstairs to be subject of the main clause,

and moves the infinitive to the end.

[The casserole seems to be done]]

This distinction between Equi and Raising is essentially one of meaning – two different kinds of verbal meaning – and can be seen by investigating meaning, but meaning is kind of a slippery subject to deal with, and syntactic research prefers to have syntactic tests.

Luckily, such tests exist; they have the same status in syntax as slide stains have in biology – they allow real differences to be made evident by taking advantage of some accidental property of the data to produce a clear distinction. There are dozens of such tests, but the two easiest ones to understand and apply are the Funny NP test and the Passive Equivalence test.

- Funny NPs are idiomatic noun phrases that are known to be limited to particular phrases or constructions, and can't occur just anywhere. Frequently they are dummies, i.e. words like the it in It's a long way to Tipperary that don't refer to anything at all, but are just there to hold a subject slot open.

Since funny NPs have limited occurrence, if they occur elsewhere they must have been moved there. So grammatical occurrence of a funny NP as subject of a Raising verb with the right kind of complement is evidence that the NP is Raising; contrariwise, since Equi verbs have real subjects, Funny NPs can't occur with them. So we can generate clear differences, for instance (in the usual idiomatic senses) [with conclusions]:

The cat seems to be out of the bag.
*The cat wants to be out of the bag.

The shit is likely to hit the fan.
*The shit is eager to hit the fan.

There appeared to be a unicorn in the garden.
*There tried to be a unicorn in the garden.

It started to snow yesterday.
*It arranged to snow yesterday.

[seem governs Raising]
[want governs Equi]
[be likely governs Raising]
[be eager governs Equi]
[appear governs Raising]
[try governs Equi]
[start governs Raising]
[arrange governs Equi]
The Cliff's on Equi and Raising

- *Passive Equivalence* refers to the fact that an active sentence means the same thing as its passive transformation (Passive is another cyclic governed rule). So

  *Bill examined Mary.*

is equivalent to

  *Mary was examined by Bill.*

If one is true, so is the other, and if one is false, so is the other. The only difference between them is in which NP is the subject. This fact can be exploited by noting that a Raising verb will raise whatever NP happens to be the subject of its complement, and thus doesn’t care whether the complement is active or passive; it will mean the same thing either way. So

  *Bill seems to have examined Mary.*

is equivalent to

  *Mary seems to have been examined by Bill.*

However, with an Equi verb, there is a different NP as subject of the main clause in each case, so the sentences aren’t synonymous, even though the complements are:

  *Bill wants to examine Mary.*

  = *Mary wants to be examined by Bill.*

These mean different things, and the conclusion is then that they have different subjects, hence Equi applies, not Raising.

That’s how the *A* Configuration works. The *B* Configuration is similar, but with an extra noun object between the main verb and the infinitive:

  **Subject - Verb - to - Object - Infinitive phrase**

There is both *B*-Raising and *B*-Equi, both occur in object complements. B-Raising raises the downstairs subject to become the upstairs object, while B-Equi already has an upstairs object (an indirect object, the receiver), and deletes the downstairs subject by coreference with it.

Some contrastive examples of B-Raising and B-Equi, with tests applied:

- *Bill wants it to rain tomorrow.*
- *Bill ordered it to rain tomorrow.*
- *Bill believes there to be no reason for that.*
- *Bill told there to be no reason for that.*
- *Bill considers Mary to have beaten Mike.*
- *Bill considers Mike to have been beaten by Mary.*

  = *Bill forced Mary to beat Mike.*

  = *Bill forced Mike to be beaten by Mary.*

For more on Equi and Raising –

  - diagrams, more examples, more tests, and exercises (with answers),
  - see [http://www.unc.edu/~jlawler/equi.pdf](http://www.unc.edu/~jlawler/equi.pdf)
Tests for Equi-NP-Deletion vs Subject Raising

Dummies (it, there)
There seems/*wants to be a party tonight. I expect/*advise there to be a party.
There is likely/*afraid to be a party tonight. It's likely/*afraid to rain tomorrow.
I expect/*advise it to rain tomorrow. It seems/*wants to be raining out.

Idiom chunks
The cat seems/is likely/*wants/*is afraid to be out of the bag.
Advantage seems/*wants to have been taken of Mary.
The shit is likely/*afraid to hit the fan soon.

Metonymy
Max is heavy. Max seems to be heavy. (Max = Max's body)
Max is Jewish. Max seems to be Jewish. (Max = Max's body)
Chomsky seems to be published in Massachusetts. (Chomsky = Chomsky's writings)
Chomsky wants to be published in Massachusetts. (Chomsky = Chomsky's writings)
Canberra contains a large central plaza. (Canberra = the city of Canberra)
Canberra refuses to compromise. (Canberra = the capital of Australia)
Canberra seems/*wants to contain a large central plaza.

All-detachment
All of the men seem to be running. All of the men want to get elected.
The men all seem to be running. The men all want to get elected.
The men seem to all be running. *The men want to all get elected.

Passive equivalence
Bill is likely to call Mary. = Mary is likely to be called by Bill.
Bill is afraid to call Mary. ≠ Mary is afraid to be called by Bill.
I expect Bill to call Mary. = I expect Mary to be called by Bill.
I advised Bill to call Mary ≠ I advised Mary to be called by Bill.

Assignment:

For each of the following predicates, determine (and give evidence for)
how many places it has, and whether it takes Raising or Equi.

afraid, appear, arrange, believe, care, cause,
consider, eager, fail, force, happen, likely,
make, manage, order, refuse, seem, start,
teach, tell, tend, try, turn out, urge, want

NB: Restrict your inquiries to those senses of the
verbs that take infinitive complements.
Object Complements

1. He **considers** himself to be a genius.
2. He **considered** dieting to be unnecessary.
3. She **considered** that the waffle iron was broken.
4. He finally **managed** to get the bill paid.
5. I **see** you found the book.
6. When you **see** her dancing, you **forget** you hate her.
7. He is **aware** that he’s a figure of fun.
8. He never **confessed** to robbing the bank.
9. You’d better **forget** about asking him again.
10. He **promised** me never to smoke another cigarette.
11. He **ordered** me never to smoke another cigarette.
12. She’s **afraid** to confront him.
13. Don’t **forget** he’s a Black Belt.
14. They **saw** her leave.
15. I **promised** to wash the dishes.
16. He **knows** why we’re here.
17. Will they **know** to come here?
18. I **listened** to him tell the story once again.
19. He **confessed** that he took the book.
20. Bill doesn’t **know** what bit him.
21. Frank is **aware** of what bit him.
22. Joe never **knew** it bit him.
Object Complements

On the preceding page you will find some example sentences illustrating several processes that apply to *object complements* (i.e., *noun clauses* that function as direct object). The *matrix predicates* (i.e., the heads of the VPs that have the noun clauses as objects) are underlined in each. These predicates are:

*see* promise *know (about)* (be) *aware (of)* *forget (about)*
*order* consider *listen (to)* *confess (to)* (be) *afraid (of)*

Each of these (like all predicates) has its special pattern of usage. The relevant variables in this pattern are the type(s) of complement (non-finite ones like infinitive and gerund, and tensed ones like *that* S and embedded *WH*-question) that are allowed or required by the matrix predicate, two rules that can apply to object complements:

1) **Equivalent Noun Phrase Deletion** (Equi; with non-finite complements)
2) **Subject-Raising** (Raising; with infinitives only)

and other rules, like **Passive**, that may be fed by these rules. Note that object complements can occur with both 2-place predicates (with A-Equi from Subject and B-Raising to Object) and 3-place predicates (with B-Equi from Object but without Raising).

Give syntax lab reports for each predicate, with example sentences (your own or ones from the data) for questions 1) – 4), noting any unusual phenomena. For example,

Predicate: *believe* 2-place predicate Test clause: PAST (WRITE (BILL, KK))

1) a Does the predicate take a plain gerund complement?
   No. *I believe Bill’s writing/having written “King Kong”.

b Does the predicate take a gerund complement with Equi?
   No. *Bill believes writing/having written “King Kong”.

2) Does the predicate take a *that*-complement?
   Yes. I believe (that) Bill wrote “King Kong”. (Optional *that*)

3) a Does the predicate take a plain infinitive complement?
   No. *I believe for Bill to write/have written “King Kong”.

b Does the predicate take an infinitive complement with Equi?
   No. *Bill believes to write/have written “King Kong”.

c Does the predicate take an infinitive with Subject-Raising?
   Yes. I believe Bill to have written “King Kong”.
   Bill believes himself to have written “King Kong”.

d Does the predicate take an infinitive feeding Passive?
   Yes. Bill is believed to have written “King Kong”. (Fed by B-Raising)

4) Does the predicate take an embedded question complement?
   No. *I believe whether Bill wrote “King Kong”.

5
1. For you to explain it again is unnecessary.
2. It's unnecessary (for you) to explain it again.
3. That he arrived late is significant.
4. It's significant (that) he arrived late.
5. That we got here on time amazes me.
6. It amazes me (that) we got here on time.
7. For me to see that again makes me sad.
8. It makes me sad (for me) to see that again.
9. (My) seeing that again makes me sad.
10. It makes me sad (my) seeing that again.
11. That she would do that makes me sad.
12. It makes me sad (that) she would do that.
13. *That he is ill seems (to me).
14. It seems (to me) that he is ill.
15. *For him to be ill seems (to me).
16. *It seems (to me) (for) him to be ill.
17. He seems (to me) to be ill.
18. For him to pass the test is likely.
19. *It's likely (for him) to pass the test.
20. He's likely to pass the test.
21. *The test is likely (for him) to pass.
22. That he will pass the test is likely.
23. It's likely (that) he will pass the test.
24. (For him) to pass the test is easy.
25. It's easy (for him) to pass the test.
26. *He's easy to pass the test.
27. The test is easy (for him) to pass.
28. For him to pass the test is possible.
29. It's possible (for him) to pass the test.
30. *The test is possible for him to pass.
31. *He's possible to pass the test.
32. That he will pass the test is probable.
33. *For him to pass the test is probable.
34. *He's probable to pass the test.
35. *The test is probable for him to pass.
On the preceding page you will find some example sentences illustrating several processes that apply to subject complements. The matrix predicates (i.e., the VPs of which the noun clauses are the subjects) are underlined in each. These predicates are:

*be* unnecessary *(be) likely seem *(be) significant *(be) easy *(be) probable *amaze someone *[s.o.]* *(be) possible make s.o. sad

Each of these (like all predicates—verb, noun, and adjective alike) has a special pattern of usage. The relevant variables in this pattern are the type of complement ( infinitive, gerund, *that* S) allowed or required by the matrix predicate, and three rules that can apply to subject complements:

1) **Extraposition.** (1-2) is an example; extraposition moves a subject complement to the end of the sentence and leaves a dummy *it* to be the subject of the matrix predicate. *That S* and infinitives may be extraposed.

2) **Subject-Raising.** (18-20) is an example; subject-raising promotes the subject of an infinitive complement to be the subject of the matrix predicate, moving the remainder of the infinitive clause to the end of the sentence.

3) **Tough-Movement.** (25-27) is an example; tough-movement promotes the object of an infinitive complement to be the subject of the matrix predicate, moving the remainder of the infinitive clause to the end of the sentence.

Give syntax lab reports for each predicate, with example sentences (your own or ones from the data) for questions (1) – (3)d. Example:

**Predicate: amaze s.o**  
Test clause: PAST (WRITE (BILL, KK))

1) Does the predicate take a gerund complement?
   *No.* *Bill's* having written *"King Kong"* amazes me.

2a) Does the predicate take a *that*-complement?
   *Yes.* *That Bill* wrote *"King Kong"* amazes me.

2b) Does the predicate take an **Extraposed** *that*-complement?
   *Yes.* It amazes me that *Bill* wrote *"King Kong"*.

3a) Does the predicate take an infinitive complement?
   *No.* *For Bill* to have written *"King Kong"* amazes me.

3b) Does the predicate take an **Extraposed** infinitive complement?
   *No.* *It* amazes me *(for Bill)* to have written *"King Kong"*.

3c) Does the predicate take an infinitive with Subject-Raising?
   *No.* *Bill* amazes me *(to have written)* *"King Kong"*.

3d) Does the predicate take an infinitive with **Tough-Movement**?
   *No.* *"King Kong"* amazes me *(for Bill)* to have written.

**Summary:** Only *that* (Extraposed optionally)
1) Who he really was is still a puzzle for historians.
2) What he did was (to) put the engine in the back.
3) What he put in the back was the engine.
4) The thing he put in the back was the engine.
5) Where he put the engine was in the back.
6) The place he put the engine was in the back.
7) The place he put the engine in was the back.
8) I want to know where he put the engine.
9) I want to know wherever he puts the engine.
10) She thinks in the back is where he put the engine.
11) Wherever he put the engine, it's hard to find.
12) Whoever did it did it well.
13) The man with whom to work is Bill.
14) The man (*who(m)) to work with is Bill.
15) To Whom It May Concern:
16) To Who(m)ever It May Concern:
17) Whenever he comes home he stays with me.
18) Whoever he is, he's a criminal.
19) Whoever gets here first wins the prize.
20) I'm interested in why he did it.
21) Bill's not here, which reminds me that he was absent yesterday.
22) What fools these mortals be!
23) What a friend we have in Jesus!
24) Who steals my purse steals trash.
25) He who laughs last laughs best.
26) The problem is that he doesn't understand.
27) What the problem is is that he doesn't understand.
28) % The problem is is that he doesn't understand.

The sentences above all all have constructions that resemble both relative clauses and questions in various ways (notably the use of wh-words).

For each, indicate some reasons why one might wish to:

a) associate its structure with a question (i.e. view it as a kind of question, or derive it from a question by some regular process)
b) associate its structure with a relative clause (ditto)
c) treat it as a separate construction (perhaps distantly related to one or the other)

NB: In some cases there may not be much difference between (a) and (b).

For extra credit, find some other constructions like these and do the same thing with them.
Garden Path Sentences

Below are some ‘garden path’ sentences. They are alike in that, when one reads them, one frequently experiences some confusion and has to restart the parse; the metaphor is ‘being led down the garden path’. This can happen in several ways.

1. The prime number few.
2. Fat people eat accumulates.
3. The cotton clothing is usually made of grows in Mississippi.
4. Until the police arrest the drug dealers control the street.
5. The man who hunts ducks out on weekends.
6. When Fred eats food gets thrown.
7. Mary gave the child the dog bit a bandaid.
8. The girl told the story cried.
9. I convinced her children are noisy.
10. Helen is expecting tomorrow to be a bad day.
11. The horse raced past the barn fell.
12. I know the words to that song about the queen don’t rhyme.
13. She told me a little white lie will come back to haunt me.
14. The dog that I had really loved bones.
15. That Jill is never here hurts.
16. The man who whistles tunes pianos.
17. The old man the boat.
18. Have the students who failed the exam take the supplementary.
19. The raft floated down the river sank.
20. We painted the wall with cracks.
21. The tycoon sold the offshore oil tracts for a lot of money wanted to kill JR.

For each sentence, describe the problem and the structures that contribute to it. Do the sentences fall into classes based on structural characteristics?

Be sure to notice in each case whether the garden-path phenomenon is restricted to reading, or whether it is also present when the sentence is spoken aloud. I.e., how much of this phenomenon is automatically disambiguated by intonation, stress, and rhythm in ordinary speech?
English Tag Questions

Among many peculiar English syntactic constructions are the so-called Tag Questions; some examples are given below.

1) You'll hear the bell, won't you?
2) She's gone already, isn't she?
3) She's gone already, hasn't she?
4) Hugo does love his little sister, doesn't he?
5) The children didn't know her, did they?
6) You were passing the shop yesterday, weren't you?
7) Mrs. Sheridan hasn't joined them yet, has she?
8) The telephone rings, doesn't it?
9) Mabel doesn't feel quite safe, does she?
10) His life won't be ruined so easily, will it?
11) She wouldn't really do that, would she?
12) Oh, you don't really think so, do you?

13) Oh, you really think so, don't you?
14) *Oh, you don't really think so, don't you?
15) *The telephone doesn't ring, doesn't it?
16) *You weren't passing the shop yesterday, weren't you?

17) Your family is still back in Hungary, aren't they?
18) He ought to be back by now, shouldn't he?
19) I'm in your way again, _______ I?
20) Let's have a look, shall we?

(1)-(12) represent the more regular kind of tag question. State a rule that expresses how they are formed. You may assume that they're related to some statement, and then do things with the various parts of that statement in order to form the tags (of course, this will require you to describe the general form of a statement).

Explain why the underlined verbs in (2) and (3) are different.

Where does the does in (8) come from?

A variation of the general-tag rule forms a rather different type of tag question, with a different sense, as in (13). How would you state this rule so that it allows (13), but excludes (14)-(16)?

What should go in the blank in (19)? Why is this a problem?

What problems do (17)-(20) raise for these rules?
English Phrasal Verbs

1. He looked at the picture.  He looked at it.
2. He looked for the picture.  He looked for it.
3. He looked up the picture.  *He looked up it.
4. He looked over the picture.  He looked over it.
5. He looked over the balcony.  He looked over it.
6. He picked out his meal.  *He picked out it.
7. He picked up his sister.  *He picked up her.
8. He picked at his meal.  He picked at it.
9. He picked on his sister.  He picked on her.
10. He took on the job.  *He took it on.
11. He took in his boss.  *He took in him.
12. He took off his jacket.  *He took it off.
13. He took to the job.  He took to it.
14. He ran over the dog.  He ran over it.
15. He looked out the window.  *He looked out it.
16. He took out his pocketknife.  *He took it out.
17. He drank up his coffee.  *He drank up it.
18. He drank down his coffee.  *He drank down it.
19. He wrote the paragraph over.  *He wrote it over.
20. He wrote over the paragraph.  He wrote over it.

*He looked it at.
*He looked it for.
He looked it up.
He looked it over.
He picked it out.
He picked her up.
He picked it at.
*He picked it on.
*He took it on.
*He took him in.
He took it off.
*He took it to.
He ran it over.
*He looked it out.
He took it out.
He drank it up.
He drank it down.
*He wrote it over.
*He wrote it over.

A peculiar construction in English is the so-called *phrasal verb*, which is a discontinuous morpheme composed of two parts: a *verb* and a *particle*. These particles often have the same form as prepositions, but behave quite differently from them.

Above are a few examples of sentences containing phrasal verbs and prepositional phrases. Distinguish one from the other and give your reasons for doing so. What generalizations can be made about each? Comment on any interesting phenomena.
English Noun Phrases

1) The man is standing in the street.
2) He is standing in the street.
3) The old man is standing in the street.
4) The dirty old man is standing in the street.
5) Is the man standing in the street?
6) Is he standing in the street?
7) Is the old man standing in the street?
8) Is the dirty old man standing in the street?
9) The man with the raincoat on is standing in the street.
10) Is the man with the raincoat on standing in the street?
11) Five old men are standing here.
12) There are five old men standing here.
13) Are five old men standing here?
14) Are there five old men standing here?
15) Five old men are here.
16) There are five old men here.
17) He is here.
18) *There is he here.
19) The man is standing here.
20) *There is the man standing here.
21) A man is standing here.
22) There is a man standing here.
23) All of the five dirty old men standing in the street with raincoats on winked at him.
24) All five of the dirty old men standing in the street with raincoats on winked at him.
25) All five dirty old men standing in the street with raincoats on winked at him.
26) Did all five of the dirty old men standing in the street with raincoats on wink at him?
27) He lives in a very large two-storey red brick Tudor house.
28) *He lives in a Tudor very two-storey brick red large house.
29) The woman whom you said you wanted to go see your lawyer about after the accident is suing you.
30) Is the woman whom you said you wanted to go see your lawyer about after the accident suing you?
31) I didn't believe a boy merely ten years old could do that.
32) I didn't believe a mere ten-year-old boy could do that.
33) I saw the man who was standing in the street.
34) I saw the man standing in the street.
35) I saw the man who was in the street.
36) I saw the man in the street.
37) I saw the man who was hungry.
38) I saw the hungry man.
1) a) John sent a book to Mary.  
b) John sent Mary a book.  
c) A book was sent to Mary by John.  
d) A book to Mary was sent by John.  
e) Mary was sent a book by John.  

2) a) John bought a book for Mary.  
b) John bought Mary a book.  
c) A book was bought for Mary by John.  
d) A book for Mary was bought by John.  
e) Mary was bought a book by John.  

3) a) John drove the car to Toronto.  
b) John drove Toronto the car.  
c) The car was driven to Toronto by John.  
d) The car to Toronto was driven by John.  
e) Toronto was driven the car by John.  

4) a) John took responsibility for Mary.  
b) John took Mary responsibility.  
c) Responsibility was taken for Mary by John.  
d) Responsibility for Mary was taken by John.  
e) Mary was taken responsibility by John.  

5) a) Mary fixed the car for John  
b) Mary fixed John the car.  
c) The car was fixed for John by Mary.  
d) The car for John was fixed by Mary.  
e) John was fixed the car by Mary.  

The English sentences above represent several different types of construction, though they look very similar on the surface.

First, determine their grammaticality and award asterisks appropriately.

Then distinguish the different syntactic patterns and how they apply. You may use other data as it occurs to you.
4.05 ENGLISH RELATIVE CLAUSES

For each of the following sentences:

a. Bracket the relative clause.
b. Insert a caret (^) in the gap where the relative pronoun originated.
c. Underline the head noun of the noun phrase to which the relative clause is attached.
d. Above each relative pronoun indicate its grammatical relation in its clause: SUB = subject; DO = direct object; IO = indirect object; OBL = oblique (e.g., object of preposition); PO = possessor. Insert any relative pronouns that are omitted.

(Data taken from the Los Angeles Times.)

EXAMPLE: This is the teacher [that I told you about].

EXAMPLE: Those fans [who braved the weather] paid a price.

1. The new law has been cheered by developers and officials who have inundated prospective immigrants with investment options.

2. Armed Croatsians and Serbs confront each other in Serbian enclaves of the Krajina, which has resisted Croatia's secession.

3. Activist Mike Hernandez is taking an "up-close and personal" approach that he hopes will help him win the council seat.

4. Pugnacious people on both sides use tax-deductible donations to carry on a fight that is really about values.

5. The environmental experts who conducted the study found that about one-third of the dangerous wastes are properly disposed of.

6. Without the benefits that free trade can provide, Mexico will never have enough money to clean up its environment.

7. Salinas must show good faith by using the limited resources that he has at hand to crack down now on polluters in Mexico.

8. Otherwise, environmental issues will continue to undermine the free-trade pact he so badly wants.
Funny NPs

Dummies:
- **there**
  - There is a unicorn in the garden.
  - I want there to be a unicorn in the garden.
  - * I told there to be a unicorn in the garden.

- **it\_Ambient**
  - It's raining. It's cold today. It's third down and twelve.
  - It seems to be raining/cold/third down and twelve.
  - * I ordered it to be raining/cold/third down and twelve.

- **it\_Fah**
  - It's a long way to Tipperary.
  - It appears to be a long way to Tipperary.
  - * I tried to be a long way to Tipperary.

- **it\_Extraposition**
  - It's too bad (that) she left. I like if *(that) he stayed.
  - * I'm afraid (that) she left. *I tried it (that) he stayed.

Idiom Chunks:
- **headway**
  - We've tried to make headway on the problem.
  - Headway seems to have been made on the problem.
  - * Headway wants to be made on the problem.

- **the beans**
  - He's totally spilled the beans.
  - The beans appear to have been spilled.
  - * The beans tried to be spilled.

- **the cat**
  - You let the cat out of the bag.
  - The cat is believed to have been let out of the bag.
  - * The cat claims to have been let out of the bag

- **the shit**
  - The shit is about to hit the fan.
  - He believes the shit to be about to hit the fan.
  - * He told the shit to hit the fan.

- **X's leg**
  - Watch out; she's pulling your leg.
  - Your leg is altogether too easy to pull.
  - * Your leg is altogether too eager to pull.

- **the bucket**
  - The old man kicked the bucket last night.
  - The bucket was kicked by the old man last night.

Conclusion: Funny NPs' (dummies, idiom chunks, various others) can provide arguments for various kinds of constituent structures, since they can occur only in very highly-constrained structures. When they can occur grammatically elsewhere, they are evidence that they have been 'moved': i.e., some syntactic rule has applied to separate the funny NP from its originating construction. This is analogous to the practice in biology of staining slides to show the structure of the material under the microscope.

* This is a technical term. See McCawley's *The Syntactic Phenomena of English*, 2nd Ed. §3c.iii, pp.74-79.
Levin Verb Class 9.7: Spray/Load Verbs
and Class 9.8: Fill Verbs

09.7 Spray/Load Verbs (Levin 1993:117-119)

brush cram crowd cultivate dab daub drape drizzle dust hang heap inject jam load
mount pack pile plant plaster prick pump rub scatter seed settle sew shower slather
smear smudge sow spatter splash splatter spray spread sprinkle spritz squirt stack
stick stock strew string stuff swab vest wash wrap

Jessica sprayed paint on the table.
Jessica sprayed (*on) the table with paint. (Spray/Load Alternation: 2.3.1)
Paint sprayed on the wall. (Causative Alternation: 1.1.2.1)
*The wall sprayed with paint.
Jessica squirited/splashed/sprayed water at me. (Conative Alternation: 1.3)
a spray of paint
*a spray of the wall
Jessica loaded boxes on the wagon.
Jessica loaded (*on) the wagon with boxes.
*Boxes loaded on the wagon.
*The wagon loaded with boxes.
*Jessica loaded/stuffed/crammed boxes at the truck.
a load of boxes
*a load of the truck

09.8 Fill Verbs (Levin 1993:119-120)

adorn anoint bandage bathe bespew bird blanket block blot bombard carpet choke
cloak clog clutter coat contaminate cover dam dapple deck decorate deluge dirty dot
douse drench edge embellish emblazon encircle enrich entwine face festoon fill fleck flood frame garland garnish impale impregnate infect inlay interlace interlard interleave intersperse interweave inundate lavish line litter mask mottle
ornament pad pave plate plug pollute replenish repopulate riddle ring ripple robe
saturate season shroud soothe soil spread speckle spoil spot stuff stain stipple stop
up sud suffuse surround swaddle swathe taint tile trim veil vein wreath

Leslie staffed the store with employees.
*Leslie staffed employees in(to) the store.
The employees staffed the store.
*The store staffed with employees.
*Leslie staffed the store in employees.

Leslie filled the bottle with water.
*Leslie filled water in(to) the bottle.
The water filled the bottle.
The bottle filled with water.
*Leslie filled the bottle in water.
Leslie soaked the blanket with water.
Leslie soaked the blanket in water.

1. Definite Descriptions (presuppose existence)
   *John saw/didn’t see the man with two heads.*
   → [presupposes] There exists a man with two heads

2. Factive verbs (factive verbs presuppose their complement)
   *Martha regrets/doesn’t regret drinking John’s home brew.*
   → Martha drank John’s home brew.
   *Frankenstein was/wasn’t aware that Dracula was there*
   → Dracula was there
   *John realized/didn’t realize that he was in debt.*
   → John was in debt.

3. Implicative verbs (implicative verbs entail their complement)
   *John managed/didn’t manage to open the door.*
   → John tried to open the door.
   *John forgot/didn’t forget to lock the door.*
   → John ought to have locked, or intended to lock, the door.
   Others: *X happened to V → X didn’t plan or intend to V*
   *X avoided Ving → X was expected to, or usually did, or ought to V*

4. Change of State verbs (COS (inchoative) verbs refer to two successive states)
   *Bill stopped/didn’t stop smoking kreteks.*
   → Bill had been smoking kreteks.
   *Joan begun/didn’t begin to enjoy herself.*
   → Joan hadn’t been enjoying herself.
   *Kissinger continued/didn’t continue to rule the world.*
   → Kissinger had been ruling the world.
   Others: *start, finish, carry on, cease, leave, enter, come, go, arrive, etc.*

5. Iteratives (iterative verbs refer to repetitions of the same event)
   *The flying saucer landed/didn’t land again.*
   → The flying saucer landed before.
   *You can’t get gobstoppers anymore.*
   → You once could get gobstoppers.
   *You used to be able to get gobstoppers.*
   → You can’t get gobstoppers now.
   *Carter returned to power.*
   → Carter was once in power.
   Others: *another time, to come back, restore, repeat, for the nth time, etc.*

6. Verbs of Judging (judging verbs refer to participants, events and their evaluation)
   *Agatha accused/didn’t accuse Ian of running away.*
   → (Agatha thinks) running away is wrong.
   *Agatha criticized/didn’t criticize Ian for running away.*
   → (Agatha thinks) Ian ran away.
7. Temporal clauses (subordinate clauses introduced by temporal conjunctions)
   Before he died. Frege had/hadn’t written about presuppositions.
   → Frege died.
   While Bill was looking for the receipt, Mary continued work on the form.
   → Bill was looking for the receipt for some period of time.
   Since Carter left office, the White House menu hasn’t had peanuts on it.
   → Carter left office.
   Others: after, during, whenever, as (as in As he was getting up, he slipped), etc.

8. Cleft sentences (It be NP that VP) / Pseudo-Cleft sentences (Wh- VP be NP)
   It was/wasn’t Rosie that kissed Henry.
   → Someone kissed Henry.
   What John lost/didn’t lose was his wallet.
   → John lost something.

9. Comparison and contrast (presuppose baseline propositions; as...as: equative; more/er: comparative; most/est: superlative)
   Barbara is/isn’t a better singer than Carol.
   → Carol is a singer.
   That idea is/isn’t as ridiculous as Bill’s suggestion.
   → Bill’s suggestion is ridiculous.

10. Relative clauses (presuppose identificational baseline propositions)
    The man that you want to see is/isn’t too busy.
    → You want to see some man. [restrictive]
    The Harrappans, who flourished 2800-2650 BCE, weren’t great architects.
    → The Harrappans flourished 2800-2650 BCE. [non-restrictive]

11. Counterfactual conditionals (presuppose negation of baseline propositions)
    If Hannibal had only had twelve more elephants, the Romance Languages would not exist today.
    → Hannibal didn’t have twelve more elephants.
    If the notice had only said ‘Mine Field’ in English as well as Welsh, we wouldn’t have lost poor Llewellyn.
    → The notice didn’t say ‘Mine Field’ in English (though it did say ‘Mine Field’ in Welsh).

12. Questions (presuppose baseline propositions)
    Is Newcastle in England or is it in Australia?
    → Newcastle is in England or Newcastle is in Australia.
    Who is the Chair of Linguistics at MIT?
    → Someone is the Chair of Linguistics at MIT.
    When does the fat lady sing?
    → The fat lady sings at some time.
## English Irregular Verbs

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Class I: Adverbial Subordinating
Conjunctions and
Conjunction Phrases

after
although
as if
as though
as long as
as much as
as soon as
as far as
as little as
as far as
because
before
even if
even though
how
if
lest
no matter how
once
since
in that
in case
in order [that]
now that
so [that]
provided [that]
supposing [that]
given [that]
than
though
till
unless
untill
when
whenever
where
wherever
whether
while
why
...

Class II: Adverbial Subordinating
Conjunctions and
Conjunction Phrases

also,
anyway,
as we were saying,
consequently,
finally,
first,
fortunately,
furthermore,
hereby,
helpfully,
however,
ideally,
in spite of this,
incidentally,
indeed,
instead,
like,
likewise,
meanwhile,
moreover,
evertheless,
next,
nevertheless,
now.
on the other hand,
otherwise,
regrettably,
regrettably,
second.
similarly,
so,
still,
surprisingly,
thankfully,
then,
therefore,
thus,
unfortunately,
well,
wherever we go,
'Verbing'

Below are two lists of infinitive verb phrases. In each class, the verb is formed from a noun; as Calvin once said, Verbing weirds language.
But verbs differ in what they mean, and occasionally in which class they belong to.

What is the basic difference between Class I and Class II?

Class I
- to seed the lawn
- to top a building
- to water horses
- to oil machinery
- to wire the house
- to carpet a room
- to cap the bottle
- to fence property
- to wax the floor
- to roof a house
... etc.

Class II
- to seed a pepper
- to top the tree
- to milk a cow
- to worm the dog
- to peel an orange
- to core apples
- to skin a cat
- to scalp the man
- to husk corn
- to sample wine
... etc.

Find five more examples of each class, and explain why each one is an example of its class.
Negative Polarity Items
(illustrated with not)

I *(don't) have any.
[but NOT any as Subject, e.g. Anyone can do that, which is Modal Polarity.]
I *(don't) ever see him. [ever = *anywhen]
He would*(n't) budge.
He did*(n't) have a red cent.
He has*(n't) been here
in weeks/ages/the longest time.
He may *(not) arrive until noon.
[until with punctual predicates]
I *(don't) have much time left.
I *(don't) have many days left.
He has*(n't) arrived yet.
You need*(n't) stare at him.
We dare *(not) disturb him.
[need & dare as modals]
I *(don't) like that at all.
It’s *(not) that easy any more.
He’s *(not) all that smart.
[be all that + adjective/adverb]
He’s *(not) too bright. [too = very]
*(Don’t) bother to close/closing the door.
That should*(n't) last long, be long, take long. [but NOT a long time]
I can*(t) seem to understand him.
I would*(n’t) care to fight with her.
I would*(n’t) mind fighting with her.
I *(don't) know but that/what he’s right.
They *(don’t) drink a drop, do a thing,
give a damn/shit, lift a finger,
bat an eye, eat a bite. ... [V+minimal D.O.]
They can*(t) help themselves.
They can*(t) help thinking of that.
I saw *(no) people there to speak of.

---

Negative ‘Triggers’
(illustrated with any)

i. Overt negatives:
A. not [w/ NPI clausemate or complement]
   He did*(n’t) know anybody.
   He did*(n’t) claim (that) he knew anybody.
   He did*(n’t) think (that) he knew anybody.
B. Incorporated negatives
   I don’t (that) he knows anybody.
   It’s unlikely (that) he knows anybody.
   It’s improbable (that) he knows anybody.
   He dislikes anybody(’s) reminding him.
   He prevented her (from) seeing anyone.
   I kept her from telling anybody.
C. Negative frequency adverbs
   I seldom/rarely see any of them.
   He hardly/scarcely knows anyone.
D. Quantifiers & quantified adverbs
   *Only* Bill did any of the homework.
   (*A) Few people see any use for it.

II. Questions (overt and embedded)
   Did you see anybody?
   How does anybody stand this?
   I wonder how anybody stands this.

III. Hypothetical clauses
   Tell me if you see anyone.
   He asked whether I saw anyone.
   Tell me whatever anybody says.
   Check the list again, lest we forget anyone.
   I’ll read it aloud, unless anyone objects.

IV. Comparatives, superlatives, etc.
   There’s more/less here than anybody knew.
   He prefers beer to any other drink.
   He’d rather die than hurt anybody.
   He’s as good as anybody expected.
   He’s the fastest one (that) anybody knows of.
   I saw him before anybody (did).
   I’m surprised (that) he knows anybody.
   It’s too dark to recognize anything.
   He left without anybody noticing (it).
   That’s hard for anybody to do.
NPI Squish

Below are 42 sentences constructed using the 6 negative triggers *whether, would rather, seldom, not, too, and only,* and the 7 negative polarity items *any more, ever, in weeks, take long, at all, yet,* and *until* (w/ punctual verb). Not all are grammatical; is there any pattern?

**HINT:** Try using a 6-by-7 grid. Maximum 1 page.

1) He's seldom *ever* eaten a mango.
2) *He would rather listen to Bach than The Beatles* *any more.*
3) *Only Bill thinks it'll take long.*
4) He hasn't slept *at all.*
5) *We want to find out whether they arrived until noon.*
6) *He'd rather watch TV than finish it yet.*
7) *He's seldom been here in weeks.*
8) He's been *too nervous to sleep at all.*
9) He has *not* *ever eaten a mango.*
10) He *seldom* *sleeps during the day at all.*
11) Only Bill has *ever eaten a mango.*
12) We have to find out *whether they've finished yet.*
13) *He would rather pace the room than sleep at all.*
14) It *seldom takes long.*
15) They didn't *arrive until noon.*
16) I need to know *whether he has slept at all.*
17) *Only Bill arrived until noon.*
18) Tell me *whether he's ever eaten a mango.*
19) *Only Bill got to sleep at all.*
20) Bill doesn't buy his suits there *any more.*
21) *Only Bill has been home in weeks.*
22) They haven't *finished the paper yet.*
23) *He's been too angry to see her in weeks.*
24) He would *rather go hungry than ever eat a mango.*
25) He is *seldom finished yet at this time of day.*
26) He's *too picky to ever eat a mango.*
27) *They would rather be late than arrive until noon.*
28) He's *too lazy to have finished yet.*
29) He hasn't *been home in weeks.*
30) *We have to find out whether he's been home in weeks.*
31) *Only Bill has finished yet.*
32) He *seldom buys his suits here any more.*
33) He's *too poor to buy his suits there any more.*
34) We have to find out *whether he buy his suits there any more.*
35) *Only Bill buys his suits there any more.*
36) This procedure won't *take long to do.*
37) It's *too simple to take long.*
38) We need to know *whether it will take long.*
39) *He would rather forget about it than take long.*
40) He *seldom arrives until noon.*
41) *He's too slow to arrive until noon.*
42) *She would rather flunk than study in weeks.*
Negative-Raising

1. Bill thought that Frank wouldn't pass the exam.
2. Bill didn't think that Frank would pass the exam.
3. Bill bet that Frank wouldn't pass the exam.
4. Bill didn't bet that Frank would pass the exam.
5. Bill expected that Frank wouldn't pass the exam.
6. Bill didn't expect that Frank would pass the exam.
7. Bill claimed that Frank wouldn't pass the exam.
8. Bill didn't claim that Frank would pass the exam.
9. Bill knew that Frank wouldn't pass the exam.
10. Bill didn't know that Frank would pass the exam.
11. Bill realized that Frank wouldn't pass the exam.
12. Bill didn't realize that Frank would pass the exam.
13. Bill wanted [Frank] not to pass the exam.
14. Bill didn't want [Frank] to pass the exam.
15. Bill told Frank not to pass the exam.
16. Bill didn't tell Frank to pass the exam.
17. Bill needed [(for) Frank] not to pass the exam.
18. Bill didn't need [(for) Frank] to pass the exam.
19. Bill is sorry that Frank didn't pass the exam.
20. Bill isn't sorry that Frank passed the exam.
21. Bill is eager not to pass the exam.
22. Bill isn't eager to pass the exam.
23. Bill intends not to pass the exam.
24. Bill doesn't intend to pass the exam.
25. The exam is hard [for Bill] not to pass.
26. The exam isn't hard [for Bill] to pass.

In the sentence pairs above, each odd-numbered sentence has a negative in a subordinate complement, while the even-numbered sentences have a negative in the main clause. Some of these pairs are synonymous, but some aren't. The difference is due to the meaning of the matrix predicate; some predicates are “transparent” to negation, and mean the same thing whether the negative is upstairs or downstairs – this is called “Negative-Raising” – but others are “opaque” to negation and mean very different things under these circumstances.

> Find 5 other matrix predicates of each kind; provide example pairs.
> In general, what kinds of predicate meanings are transparent to negation?
Making the Point with Metaphors: Not Just for Poets

BY JOHN LAWLER

Twenty-five years ago at Berkeley, a linguistics professor and a visiting philosopher began a little book with the following words:

Metaphor is for most people a device of the poetic imagination and the rhetorical flourish—a matter of extraordinary rather than ordinary language. Moreover, metaphor is typically viewed as characteristic of language alone, a matter of words rather than thought or action. For this reason, most people think they can get along perfectly well without metaphor. We have found, on the contrary, that metaphor is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature.

The book, *Metaphors We Live By* (University of Chicago Press), has sold briskly ever since and is still in print. It was the right book at the right time; a year later, a *Village Voice* article credited the authors, George Lakoff (the linguist) and Mark Johnson (the philosopher), with starting a publishing boom in books about metaphor. George Lakoff (now billed as a cognitive scientist) has once again hit the best-seller lists with another little book, *Don't Think of an Elephant!* (Chelsea Green Publishing, White River Junction, VT), which deals with the power of metaphor (now called *framing*) in the American political process.

In the quarter-century between these two little books, the cognitive processes collectively and variously known as metaphor, schemas, simile, analogy, or framing (depending on one's theoretical bent) have surfaced again and again in places where they hadn't been expected. Why should the average communicator care? Because metaphor's ability to direct attention and convey ideas subliminally is simple, powerful, and universal—and it's impossible to avoid noticing it in action everywhere, once you're attuned to it. Your favorite writers already understand this, which is why they're your favorites.

**Metaphors we compute by**

A case in point can be found in the single most significant technological development of the last quarter-century: the advent of the personal computer. There were personal computers in 1980, but they were simply smaller versions of mainframe computers (remember DOS?). However, this was about to change. The Macintosh was under development when *Metaphors We Live By* came out; copies were obtained for the...
development team, and the desktop metaphor began to enter conversations. The result was historic, to say the least.

The desktop revolution was not, of course, completely due to the efforts of Lakoff and Johnson; ideas like this were in the air all around computerland, and still are—which is hardly surprising since computers were straightforwardly designed to be metaphors. The original impetus behind computing was the attempt to subcontract human brain labor to a machine by building a sort of model of what the brain does in calculating. This led, in turn, to a whole new set of experiences with computing and the consequent need to talk about them.

But because there were no traditional ways to talk about these new experiences, the entire computing enterprise became a hot-house for metaphors. Exotic blooms are continually being pulled in from elsewhere and assigned new metaphorical meanings: editor, file, folder, spreadsheet, hacking, jump drive, slide show, the Net, the Web, surfing, spam, overflow, virus, worm, cut-and-paste, cyberspace, garbage, troll, wizard... the list goes on. And changes constantly, like any living thing.

This is just one area where recent technology has reframed our language use. We now, for instance, have to use retro-qualifications like acoustic guitar, analog watch, and brick-and-mortar store to indicate what used to be understood simply as a guitar, watch, and store; and we will soon need a good term for a camera that uses film instead of a CCD (charge-coupled device).

Life, the universe, and everything

But it's not just technology, though that's the clearest, most obvious recent case. It's always been the case that people use metaphors to talk about difficult ideas by taking terms from common experiences and situations (frames, in the trade) and using them in different contexts (frame mapping) to mean different things. Thus, while the concept of time is something we talk about all the time, we rarely use words that are exclusively temporal to do so; indeed, only half a dozen or so English words refer exclusively to time: now, then, when, during, duration, endure. Instead, we talk about time using two major metaphor themes: Time is Money (save an hour, spend an hour, waste an hour, lose an hour, thank you for your time) and Time is Spatial (before, after, a long time, a short while, from 9 to 5, look forward to, see it coming, put it behind you). It's difficult, if not impossible, to discuss time in English without using these metaphor themes, which are standard resources for everybody.

Time is not the only human imponderable that metaphors help with. When one talks about being enchanted by, falling in love with, or being crazy about somebody, one is using metaphor themes—respectively, Love is Magic, Love is Out of Control, and Love is Madness (a subtype of Love is Out of Control)—to talk about humanity's favorite mystery. Less heady forms of love, such as long-term relationships, use themes like Love is a Journey (at a crossroads, a dead-end relationship, not going anywhere, on the rocks, and Freud's famous railroad/tunnel symbols).

And then there are science and math. All scientific theories and all of mathematics are metaphors—very complex and carefully worked-out metaphors, but metaphors nonetheless. Maxwell's equations, for instance, which describe the properties of electricity and magnetism, were swiped wholesale from hydrodynamic equations of fluid motion, as in Electricity is a Liquid.
whence also electrical terms such as current, flux, conduction, and juice.

Math is based on numbers, which are based on the process of counting, which comes from the oldest human activity: collection of resources, typically food—the gathering part of hunting and gathering societies. It’s recently been established, incidentally, that the part of the brain involved in counting and mathematics is precisely that part that controls the hands, also used in gathering.) This is why people have trouble understanding negative numbers if they’ve been taught subtraction as 5 take away 2 leaves 3; to them, 2 take away 5 leaves minus 3 makes no sense at all—until they learn a metaphor different from the gathering one.

Seeing is believing

Finally, religion and philosophy grow by the accretion and elaboration of metaphors, just like other branches of human knowledge and activity. It’s easy to see animistic religion as just the personification of natural forces such as lightning, rain, and sun; what’s not so obvious is how metaphorical the bases of recent successful religions are. Christianity, for instance, is permeated by the concept of Light. Saints and holy people glow with halos; Christ repeatedly uses actinic metaphors like the Light of the World; a convert is said to have seen the light, and so on.

This is a very old metaphor, traceable to prehistoric times and beyond. In Proto-Indo-European—the reconstructed language ancestral to Indic, Iranian, and European languages, including English—the root *vet-, which is the source of the English words vit, wise, and wisdom, is also the source of video and vision (from Latin) and idea (from Greek). The basic idea (part of the expression) is that THINKING IS SEEING and, therefore, THOUGHT IS A LIGHT MEDIUM. This comes through very clearly in the Sanskrit word Veda, the name of the holiest of Hindu holy works, which also comes from *vid- and means, literally, wisdom. This metaphor is well established in our culture, too, as can be seen from the phrases it dawned on me, I see what you mean, a brilliant idea, or terminally dim.

Not to mention the picture of a lightbulb over a cartoon character, or the meaning of images such as the light in the attic.

Ontology recapitulates physiology

At their root, all these metaphors (and the many thousands of others that make up our cognitive systems) have one thing in common—the only thing that all humans have in common, and thus the only thing everyone can understand experientially: the human body. Our metaphoric concept of COUNTING comes ultimately from a grasping hand, THINKING from a perceiving eye, MARRIAGE from a couple setting out together on a long journey, and so forth.

This is perhaps the most significant discovery of cognitive science in the past 25 years: that abstract knowledge proceeds ultimately from metaphorical expressions of human physiological perception and motor programs. In short, THE MIND is a metaphor—a metaphor, in fact, of THE BODY.

The mind/body problem has been solved; and with its solution comes a realization, in cognitive terms, of what great writers have always understood—that we have no choice in the matter: We HAVE to use metaphors to understand the world around us. We expect others to use them, too; we depend on those others to suggest metaphorical ways we can use to do that, and these understandings are most powerful and empowering when they are couched in themes drawn from the human body and its (our) experiences. No writer can afford to be ignorant of these facts.

J. Lawler is a linguist at the University of Michigan, where he studies metaphor, writes about grammar, and teaches writing. For details, see www.english.umich.edu/~lawler/blodgett. And watch for his new grammar column in the May issue.
Metaphor

"... understanding one thing in terms of another" — Lakoff & Johnson

Three levels of meaning for the term metaphor:

- **Metaphor**: a phenomenon of human Language and Cognition
- **Metaphor Theme**: an individualized symbolic pattern in a language
  (e.g., TIME is MONEY in English)
- **Instantiations** of metaphor themes: (e.g., I spent an hour.)

Some metaphor themes:

1) **TIME is MONEY** A Metaphor Theme that licenses English speakers to refer to their experience of duration with words defined in terms of the commercial exchange of valuable resources, i.e., money:

   I spent thirty hours on that job.
   I spent thirty dollars on that lamp.
   I lost quite a bit of time in the traffic jam.
   I lost quite a bit of money in the casino.
   I saved a few minutes by taking the shortcut.
   I saved a few dollars by painting it myself.
   That cost him two years of his life.
   That cost him two million dollars of his money.
   I thought that was worth the time it took.
   I thought that was worth the money it cost.
   I contributed a lot of time to charity.
   I contributed a lot of money to charity.

   a) What counts as what in the metaphor theme?

   e.g.,

<table>
<thead>
<tr>
<th>TIME</th>
<th>MONEY</th>
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<tbody>
<tr>
<td>(amounts of) time</td>
<td>(amounts of) money</td>
</tr>
<tr>
<td>state or event experienced</td>
<td>commodity purchased</td>
</tr>
<tr>
<td>(human) experiencer</td>
<td>(human) purchaser</td>
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<tr>
<td>[no equivalent]</td>
<td>[no equivalent]</td>
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</table>

   b) What doesn't work?

   e.g. *I paid thirty hours for that job. (because pay refers to seller)

   c) How else do we refer to time?

   1) **TIME is SPACE**: A metaphor theme that licenses English speakers to refer to temporal phenomena with words and expressions defined in terms of (their experience of linear motion in) space.

   e.g., a long/short time
   put it behind you
   years passing
   at this point in time

   before/after
   look forward to it
   the coming weeks
Metaphor

2) What's UP? English speakers (like all humans) are oriented vertically with respect to a gravitational field, so the up/down dimension is significant, and English uses it in a variety of metaphor themes. All of them are coherent, i.e., we tend to think of them in the same ways (e.g., LESS, SAD, WEAK, PASSIVE, and WORSE are all negative evaluations, and vice versa.)

a) UP is MORE (DOWN is LESS):
   The prices are rising/falling.
   The stockmarket's moving up/crashing.
   Turn the volume up/down.

b) UP is HAPPY (DOWN is SAD):
   He's depressed.
   Feeling up/down
   What a downer!

c) UP is POWERFUL (DOWN is WEAK):
   upper/lower classes
   superior/subordinate
   the highest levels of the government
   oppressed masses

d) UP is ACTIVE (DOWN is PASSIVE):
   The computer is up/down.
   Are you up for some handball?
   Rise to the occasion.

e) UP is BETTER (DOWN is WORSE):
   higher/lower animals
   He fell down on the midterm.
   a rise/fall in performance
   aim high
   upwardly-mobile

f) UP is ABSTRACT (DOWN is CONCRETE):
   He's got his head in the clouds.
   He's got his feet on the ground.
   Come back to earth.
   higher mathematics
   high-level cognitive functions
   low-level details
   new heights of abstraction
   down-to-earth solution
Metaphor

We know almost nothing about the human mind, yet we talk about thoughts and beliefs and emotions constantly, and have thousands of words in every language that refer to the mind. Such a concept is a good candidate for a metaphor, and indeed there are several big themes in English that purport to inform us what “The Mind” is.

One example is already provided for each of the following metaphor themes. Find 5 more examples for each.

Ideally, you should listen/watch for them in others’ speech or writing.

1) **THOUGHT** is **LIGHT**; **KNOWING** is **SEEING**
   That’s a bright idea; I see what you mean.

2) **THE MIND** is **A CONTAINER**
   He has a pretty closed mind.

3) **THE MIND** is **A PLACE**
   That thought had crossed my mind.

**THE MIND is A HOUSE** is a specific combination of all of the themes above. A house is a place, and is a container as well. More importantly, it is a container for people, who are implicated in the first theme as being the ones who do seeing, and therefore thinking. This, in turn, is coherent with the theory of thought and consciousness which attributes one’s inner experience to a homunculus (Latin, ‘little man’) inside one’s mind. As a scientific theory, this is a bust, since it just raises the question of what’s inside the homunculus’s mind, and so ad infinitum; but as a satisfying explanation for why we do what we do, it has a long history.

Other metaphor themes are found in other contexts. For some more examples, in a novel context, point your browser at:

http://www-personal.umich.edu/~jlawler/mnt4compute.html
The Conduit Metaphor

A very important metaphor theme in English is called the **Conduit Metaphor**. This theme is present in the vast majority of English expressions that refer to communication, speech, language, or meaning. It is important to be able to recognize instances of the Conduit Metaphor, because many communicational pathologies are based on it.

The Conduit Metaphor refers to communication, to language use. It consists of several coherent parts:

a) **Words and their meanings** (or ideas) are both objects

b) **Words are containers** for ideas, filled by the speaker

c) **Communication is transmitting words in sentences; listeners understand the meaning by unpacking the containers**

For instance, in (1) that idea is conceived of as bridging some physical gap between the speaker and the listener, as the use of get across to shows:

(1) It's hard to get that idea across to him.

Instead, one might say (2), which doesn't make use of the Conduit Metaphor:

(2) It's hard to make him understand that idea.

Here are some other examples of the Conduit Metaphor. For each, construct an equivalent paraphrase that doesn't use that theme.

(3) His promises were hollow.

(4) There isn't a single good idea in that book.

(5) He conveys his desires very effectively.

(6) I didn't get anything out of that lecture.

(7) He got the idea out of an old novel.

(8) You've got to get more meaning into fewer words.

**Hint:** Be very careful of using the words *in* or *into*, or any word that refers to the same thing, like *contain*.
Grice's Maxims

The Rules of Cooperative Conversation
(from H.P. Grice, "The Logic of Conversation")

Maxims of Quantity
1. Make your contribution as informative as is required.
2. Do not make your contribution more informative than is required.

Maxims of Quality
1. Do not say what you believe to be false.
2. Do not say that for which you lack adequate evidence.

Maxims of Manner
1. Avoid obscurity of expression.
2. Avoid ambiguity.
3. Be brief.
4. Be orderly.

Maxim of Relation
1. Be relevant.

Like many rules of human behavior, Grice's Maxims are idealized, and often violated in practice. Find violations of each maxim and characterize them in a short (2/pg maximum) essay. Questions to consider include:

- Are some violations more common than others? Why?
- Are some more common in writing than in speech? Why?
- Are some more common in computer-mediated communication? Why?
An Ontology for English Verbs of Cutting

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Levin 21.1: "cut" verbs
chip chip cut hack hew saw scrape scratch slash snip

Levin 21.2: "carve" verbs
bore bruise carve chip chop crop crush cube dent dice drill file
fill et gash gouge grate grind mangle mash mince mow nick notch
perforate prune pulverize punch shred slice slit spear squash squish

Constituents:
Agent (prototypically human) Contact (instrument / target surface)
Target (relatively soft) Cision (on surface of target)
Instrument (with sharp edge) Results of cision (severance, etc.)
Motion(s) Context of normal use

Possible parameters:
Activity context:
Cooking Farming Sewing Carpentry Fighting Construction

Instrument:
Name and type of instrument Contact:
Edge of instrument Energy of contact
Shape of edge Direction of contact
Length of edge Duration of contact
Location of edge Location of contact
Number of edges On instrument
Application of edge to target On target
Point vs edge Control and consistency of contact

Cision:
Shape of cision Motion:
Length of cision What moves:
Depth of cision Instrument
Completion of cision Agent
Geometry/topology of cision Target
Smoothness of cision Repetition of motion
Pieces (resulting from cision) Direction & path of motion
Number, size, & shape Kinesthetics of motion
Ballistic nature of motion

82
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<tr>
<th>Assonance</th>
<th>Semantics (Embodied Image)</th>
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<tr>
<td><strong>st-</strong> 1-Dimensional Rigid (Standing Man)</td>
<td>stick staff stem stub stab step stake stiff stilt</td>
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<td><strong>str-</strong> 1-Dimensional Non-Rigid</td>
<td>strap string strand strain strip streak stream straw stand stretch</td>
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<td><strong>br-</strong> 1-Dimensional Connected (Plant)</td>
<td>brush break bridge brim briar browse branch bramble</td>
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<tr>
<td><strong>br2</strong> Human (Gender Roles) M: brute brawl bruise bris F: breed broad breast bread</td>
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<td><strong>pr1-</strong> 1-Dimensional Extended</td>
<td>prick prod prop prow pretzel privat prong probe prawn prone</td>
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<td><strong>pr2</strong> Human (Social Roles)</td>
<td>proper prim priest prom prissy primp proud pray preen</td>
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<td><strong>fl-</strong> 2-Dimensional Floating</td>
<td>float flap flap flense fletch flood flam flange fleas fleece floe floor flip flunk</td>
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<td>plush plump plaque plaster plank plate plow pleat plait platter plop</td>
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<td><strong>sn1-</strong> 3-Dimensional Convex w/ Concave (Fingers)</td>
<td>snap snare snatch snip snooker snag sneak</td>
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<td><strong>sn2</strong> 3-Dimensional Convex w/ Concave (Nose)</td>
<td>sneeze sniff snoot sneer snub snarl snore snot</td>
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<td><strong>bl-</strong> Color (Eye)</td>
<td>blue blood blush black blank blotch blaze blind blond bleach blur bloom</td>
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<td><strong>bl2</strong> Compressed Fluid (Eye)</td>
<td>blimp blush bloom blot blain blintz blood blow boat</td>
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<td><strong>bl-</strong> Excess ('too much')</td>
<td>blotto blister blast bluster blab bliss bleep blare blemish</td>
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<td><strong>gl-</strong> Reflected Light (Eye)</td>
<td>glaze glimmer glimpse glem glance glare glace glow gloom</td>
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<td><strong>kr-</strong> 1-Dimensional Bent</td>
<td>crutch cripple crack crotch cross crank crimp crevice crane crouch</td>
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<td><strong>kl-</strong> Connection ('together')</td>
<td>club clutch clam clamp clasp cluster clench click cling</td>
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<td><strong>skr-</strong> 2-Dimensional + 1-D Motion</td>
<td>scrub scram scratch scribe scrape scrawl screw scroll scribble</td>
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<td><strong>sl1-</strong> Liquid/Solid Interface</td>
<td>slash slope sleet slick slather slime slurp slough sluice slide</td>
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<td><strong>sl2-</strong> Pejorative lobe slut slander slang sludge slum sloth sleazy slobber slouch slur slope</td>
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<td>sprout spread sprig spruce (Liquid)</td>
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<td>sky scum stuff scour scale skate skid skin skip skirt scab</td>
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<td>swirl swerve swash swing swoop sweep swath swab swish swizzle</td>
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<td>dredge drink drop drown drought dry drain dribble drizzle drool drip</td>
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<td>trudge trample trot trail trapse trip tread trek truck train tram track trolley</td>
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<td><strong>y-</strong> Vocal</td>
<td>yack yammer yap yowl yell yip yawn Interjection yuck yow yum yup yike yay</td>
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Category 1 Human (Gender Role):

Male: 32 (essentially, aggressive display and territorial defense)

bris brate brawl brag brave bruise bray brawn brandish britches

Female: 19 (essentially, breeding and feeding)

breast bride bra brat bread braid brood broil broth braise broad

2 1-Dimensional (Connected) Embodied Image: Plant

1a: 5 1-D Aggregate Connected by 0-D X

bristle brush bracken bramble briar

1b: 6 1-D Aggregate Connected by 1-D X

bristle brush brand bridle braid broom branch bract

1c: 2 1-D Aggregate Connected by 2-D X

bristle brush browse brake

2a: 12 Contiguous X Aggregate Connected by 1-D

broad brim brow brink breadth breach broach break brittle

2b: 8 Non-Contiguous X Aggregate Connected by 1-D

bridge brace breech bracket brad

3 Leakage from BL-

BL1: Fluid 14

brandy brackish brant brit bream breeze brook breath breathe

BL2: Color 6

brown bright brindle bronze bruise
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V. Conclusion

For the data fetishists that constitute my prospective audience, I have included here four appendices, with examples of 62 of the 96 vigesimal rimes, and full particulars for the top 6 that I have discussed here. In addition, a list of all non-vigesimal rimes appears in Appendix B. That leaves only those 34 vigesimal rimes that I do not consider to have any significant phonosemantic coherence. I provide below a list of these, with their size.

All of the data for these and for the rimes in the Appendices were extracted from the database in the first instance. Semantic coding, however, is not part of the database; therefore, I am making the coded data available in a collection of 96 ASCII files, one for each vigesimal rime, archived on my Web site, at http://www.umich.edu/~lawler/rimes.zip. I encourage anyone interested in this phenomenon, and their students, to download the database, and these data files, and second-guess me.

This kind of activity is especially interesting, I have found, for students, and it makes a splendid student project that can, if done carefully, provide significant information and generalizations. There are many, many more phenomena left to investigate here; and each one demonstrates what I consider the best-kept secret in America – that linguistics is fun.

| Non-Coherent Vigesimal Rimes (rimes occurring in 20 or more simplex words) |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| -er | 76 | -et | 37 | -og | 30 | -et | 26 | -aro | 22 | -ev | 20 |
| -or | 33 | - образ | 34 | -in | 29 | -el | 26 | -art | 22 | -ayr | 20 |
| -ay | 45 | -ak | 32 | -el | 29 | -en | 26 | -est | 22 | -ed | 20 |
| -ey | 44 | -aw | 31 | -id | 28 | -ek | 26 | -ayd | 21 | -id | 20 |
| -ok | 40 | -in | 31 | -al | 28 | -ev | 25 | -aes | 21 |
| -el | 37 | -ut | 31 | -en | 27 | -iz | 24 | -un | 21 |

This document is available online at http://www.umich.edu/~lawler/rimecoherencehandout.pdf
Appendix A  Vigesimal Rimes in Simplex Words, by Phonosemantic Coherence

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| -al   | 28  | 24  | 86% | 2  |
| -ab   | 34  | 29  | 85% | 3  |
| -amp  | 26  | 22  | 85% | 4  |
| -agk  | 22  | 18  | 82% | 5  |
| -tp   | 41  | 32  | 78% | 6  |
| -ag   | 31  | 24  | 77% | 7  |
| -tz   | 21  | 16  | 76% | 8  |
| -tgk  | 34  | 25  | 74% | 9  |
| -ek   | 47  | 33  | 70% | 10 |
| -eg   | 39  | 27  | 69% | 11 |
| -ej   | 25  | 17  | 68% | 12 |
| -eg   | 27  | 18  | 67% | 13 |
| -ep   | 30  | 20  | 66% | 14 |
| -ig   | 32  | 21  | 66% | 15 |
| -il   | 23  | 15  | 65% | 16 |
| -es   | 20  | 13  | 65% | 17 |
| -et   | 53  | 34  | 64% | 18 |
| -fr   | 31  | 19  | 61% | 19 |
| -tnt  | 20  | 12  | 60% | 20 |
| -emp  | 22  | 13  | 59% | 21 |
| -ab   | 34  | 20  | 59% | 22 |
| -rt   | 47  | 27  | 57% | 23 |
| -ik   | 48  | 27  | 56% | 24 |
| -eb   | 34  | 20  | 56% | 25 |
| -em   | 35  | 19  | 54% | 26 |
| -um   | 24  | 13  | 54% | 27 |
| -ez   | 26  | 14  | 54% | 28 |
| -end  | 21  | 11  | 52% | 29 |
| -st   | 37  | 19  | 51% | 31 |

62 Coherent Rimes, with examples (often overlapping)

Examples

- **RL81** Ab Cess chop drop Ballistic topple hop Sep chop crop Impact flop hop

- 2D shawl sprawl wall Motion crawl brawl haul falli Contact maul trawl spell awl

- 1D Thick slab club chub stabble Dim shrub stub cub Pej flub lubber ruffle

- **RL81** 3D ramp lump lamp slump stamp Pej frump grump chump rumpus

- Pej junk flunk bunk skunk drunk Hum punk lunk monk Aural clunk thunk plunk

- 2D+3D pip lip grip flip blip 2D-3D nip chop snap dip Dim sip sip tip ripple

- Pej ugly ugly lug slug thug mug Fluid slug jug chug 3D Dim mugget snug

- Separated/Dispersed/Multiple fizzle drizzle schism sizzle dizzy dishy jism chrism

- Dim slink trinket tinker wink shrink dinky Dim Aural chink dink plunk tinkle

- 2D Connected plaque stack bracket tacky Aural crack clack quack yack

- Crooked/Broken snog zag cag cag rag 2D drag rag wagon swagger flag

- **RL81** Violent Contact bash trash crash thrash sash gash

- 1D Connected hang angle dangle tongue Aural jangle bang clang

- **RL81** 2D flap clap lap rap wrap Contact slap strap chaf rap tap

- **RL81** Dir Force sing spring ring Dim Aural ping ding jingle jingo

- 1D Crossed fess wrestle trestle press chess wrestle trestle

- (Tongue) 2D pat slay mat spatter flat Speech blah chatter spat prattle

- 2D Friction scuff snuff shuffle ruffle rough Indist Sens fluff muffle gruff

- Dim Multiple splinter glint hint lint sinter sinit Visual/Eye glint squint

- 2D Contact clamp cramp tamp damper ramp tromple champ stamp scamper

- 3D Extrusion knob job glob bobbin cobble gob cob blob

- Dim spit whistle little kitten bii grii twitit ditity jitter critter

- Dim 3D: Conclave nick crack tick click fliek hickey Convex prick wick tickle

- Pej rabble drab shabby crab Speech blabber jabber babble gabble

- 2D Contact slam hammer flim flam cam cam Aural bam blam clamor stammer

- 3D Interior/Expansion room womb tomb bloom tumor

- 2D Contact grace glaze blaze brace brave breeze rayse Indist Sens daze haze race

- 1D Non-Linear bend wend wend Mix/Fluid mend render blend

- 1D+2D stand strand sandal band hand Pej bland vandal pander scandal

- 3D Conclave/Closure gut shut rut butt hut rut glut gutter putty shutter stutter

Diminutive, 2-Dimensional, 3-Dimensional, Indistinct Sensation, Pejorative, (Embodyed Image)

Appendix A  Vigesimal Rimes in Simplex Words, by Phonosemantic Coherence

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62 Coherent Rimes, with examples (often overlapping)

Examples

- Clothing/Stricture(?) gusset hussy truss bustle muss gussy
- Alphabet B C D E Closed Class 3 he she we be
- Articulation/Body Part flank ankle shank hank spank yank crank wank
- Pej irk lurk murl turkey jerk shirk smirk
- (Mouth/Tooth/Claw) crow paw claw jaw maw grow
- Dim Multiple shiver quiver sliver sieve divot rivet
- 2D shim trim rim scrim skin shimmer swim
- Light light bright white sight Fight fight smite bite Up height kite
- Vertical steep teepee leap heap deep Aural bleep cheap peep
- Liquid flood blood mud cruel puddle rudder udder
- 2D Concave fill drill gill roll 2D Convex hill spill pillow frill billow quill
- Out/Off/Remove shuck buck chuck duck pluck suck
- 2D Contact bow blow flow floe grow hoe low now sow saw snow loess
- Ind Sens blur fur purr slurry slur scurry lurid
- Aggressive Contact clout shout bow flow low know rout
- Earth/Contact/Movement clod sod shod hod plod toddler dodder waddle
- RL81 1D (Plant) vine vine pine cline line spline tine spine
- 1D chain cane crane lane rein train vein 2D vane pane plain plane blain
- RL81 Curve scoop droop group hoop loop stoop swoop
- Round knoll roll roly polly whole thole bowl boll hole bolo holus
- 2D fan flan pan scan span panel banner
- Dim Color dot blot spot knot clot mottle blono dottle jolt slot
- 2D Surface float boat blot moat lous (RL81 Water) stow throat
- Pej seum sum bum dumb glum crumb numb
- Spread bed lead sled sled pedal
- Noise tone phone drone groan moan
- Face/Eye/Nose/Ear sneer smear clear leer peerbleer jeer ear hear
- 2D cleat pleat sket sket seat peat beetle
- Liquid/Thick goo flue dew brew glue slough sprue spew stew fluid sewer

Diminutive, 2-Dimensional, 3-Dimensional, Indistinct Sensation, Pejorative, (Embodied Image)


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90
Appendix C

Snapshots of the 3 Most Coherent Rime Sets

- ap 31 words  
27 coherent  
Coherence Level 87%  
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# Appendix C

## Snapshots of the 3 Most Coherent Rime Sets

- **Category**
  1. contact
  2. 2-Dimensional
  3. motion
  4. expanse
  5. horizontal orientation
  6. vocal image

- **Coherence Level**: 86%
- **Rank**: 2

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- **-ab** 34 words  29 coherent  Coherence Level 85%  Rank 3

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### Appendix D
Snapshots of the 3 Next Most Coherent Rime Sets

**-omp** 22/26 = 85% Rank 4 [overlap 1]

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**-ank** 18/22 = 82% Rank 5 [overlap 4]

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<th>4) Piece (2)</th>
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**-ip** 32/41 = 78% Rank 6 [large overlap]

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1a) Convex/Up [+3D] (18)

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<th>1b) Concave/Down [-3D] (19)</th>
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Body Ritual Among the Nacirema

Horace Miner
University of Michigan

The anthropologist has become so familiar with the diversity of ways in which different peoples behave in similar situations that he is not apt to be surprised by even the most exotic customs. In fact, if all of the logically possible combinations of behavior have not been found somewhere in the world, he is apt to suspect that they must be present in some yet undescribed tribe. This point has, in fact, been expressed with respect to clan organization by Murdock (1949: 71). In this light, the magical beliefs and practices of the Nacirema present such unusual aspects that it seems desirable to describe them as an example of the extremes to which human behavior can go.

Professor Linton first brought the ritual of the Nacirema to the attention of anthropologists twenty years ago (1936: 326), but the culture of this people is still very poorly understood. They are a North American group living in the territory between the Canadian Cree, the Yaqui and Tarahumare of Mexico, and the Carib and Arawak of the Antilles. Little is known of their origin, though tradition states that they came from the east. According to Nacirema mythology, their nation was originated by a culture hero, Notnaishaw, who is otherwise known for two great feats of strength—the throwing of a piece of wampum across the river Pa-To-Mac and the chopping down of a cherry tree in which the Spirit of Truth resided.

Nacirema culture is characterized by a highly developed market economy which has evolved in a rich natural habitat. While much of the people’s time is devoted to economic pursuits, a large part of the fruits of these labors and a considerable portion of the day are spent in ritual activity. The focus of this activity is the human body, the appearance and health of which looms as a dominant concern in the ethos of the people. While such a concern is certainly not unusual, its ceremonial aspects and associated philosophy are unique.

The fundamental belief underlying the whole system appears to be that the human body is ugly and that its natural tendency is to debility and disease. Incarcerated in such a body, man’s only hope is to avert these characteristics through the use of the powerful influences of ritual and ceremony. Every household has one or more shrines devoted to this purpose. The more powerful individuals in the society have several shrines in their houses and, in fact, the opulence of a house is often referred to in terms of the number of such ritual centers it possesses. Most houses are of wattle and daub construction, but the shrine rooms of the more wealthy are walled with stone. Poorer families imitate the rich by applying pottery plaques to their shrine walls.

While each family has at least one such shrine, the rituals associated with it are not family ceremonies but are private and secret. The rites are normally only discussed with children, and then only during the period when they are being initiated into these mysteries. I was able, however, to establish sufficient rapport with the natives to examine these shrines and to have the rituals described to me.

The focal point of the shrine is a box or chest which is built into the wall. In this chest are kept the many charms and magical potions without which no native believes he could live. These preparations are secured from a variety of specialized practitioners. The most powerful of these are the medicine men, whose assistance must be rewarded with substantial gifts. However, the medicine men do not provide the curative potions for their clients, but decide what the ingredients should be and then write them down in an ancient and secret language. This writing is understood only by the medicine men and by the herbalists who, for another gift, provide the required charm.

The charm is not disposed of after it has served its purpose, but is placed in the charm-box of the household shrine. As these magical materials are specific for certain ills, and the rest or imagined maladies of the people are many, the charm-box is usually full to overflowing. The magical packets are so numerous that people forget what their purposes were and fear to use them again. While the natives are very vague on this point, we can only assume that the idea in retaining all the old magical materials is that their presence in the charm-box, before which the body rituals are conducted, will in some way protect the worshipper.

Beneath the charm-box is a small font. Each day every member of the family, in succession, enters the shrine room, bows his head before the charm-box, misgives different sorts of holy water in the font, and proceeds with a brief rite of ablution.
The holy waters are secured from the Water Temple of the community, where the priests conduct elaborate ceremonies to make the liquid ritually pure.

In the hierarchy of magical practitioners, and below the medicine men in prestige, are specialists whose designation is best translated "holy-mouth-men." The Nacirema have an almost pathological horror and fascination with the mouth, the condition of which is believed to have a supernatural influence on all social relationships. Were it not for the rituals of the mouth, they believe that their teeth would fall out, their gums bleed, their jaws shrink, their friends desert them, and their lovers reject them. (They also believe that a strong relationship exists between oral and moral characteristics. For example, there is a ritual ablation of the mouth for children which is supposed to improve their moral fiber.)

The daily body ritual performed by everyone includes a mouth-rite. Despite the fact that these people are so punctilious about care of the mouth, this rite involves a practice which strikes the uninitiated stranger as revolting. It was reported to me that the ritual consists of inserting a small bundle of hog hairs into the mouth, along with certain magical powders, and then moving the bundle in a highly formalized series of gestures.

In addition to the private mouth-rite, the people seek out a holy-mouth-man once or twice a year. These practitioners have an impressive set of paraphernalia, consisting of a variety of augers, awls, probes, and prods. The use of these objects is the exorcism of the evils of the mouth involves almost unbelievable ritual torture of the client. The holy-mouth-man opens the client's mouth and, using the above mentioned tools, enlarges any holes which decay may have created in the teeth. Magical materials are put into these holes. If there are no naturally occurring holes in the teeth, large sections of one or more teeth are gouged out so that the supernatural substance can be applied. In the client's view, the purpose of these ministrations is to arrest decay and to draw friends. The extremely sacred and traditional character of the rite is evident in the fact that the natives return to the holy-mouth-men year after year, despite the fact that their teeth continue to decay.

It is to be hoped that, when a thorough study of the Nacirema is made, there will be a careful inquiry into the personality structure of these people. One has but to watch the gleam in the eye of a holy-mouth-man, as he jars an awl into an exposed nerve, to suspect that a certain amount of sadism is involved. If this can be established, a very interesting pattern emerges, for most of the population shows definite masochistic tendencies. It was to these that Professor Linton referred in discussing a distinctive part of the daily body ritual which is performed only by men. This part of the rite involves scraping and lacerating the surface of the face with a sharp instrument. Special women's rites are performed only four times during each lunar month, but what they lack in frequency is made up in barbarity. As part of this ceremony, women bake their heads in small ovens for about an hour. The theoretically interesting point is that what seems to be a preponderantly masochistic people have developed sadistic specialists.

The medicine men have an imposing temple, or latipso, in every community of any size. The more elaborate ceremonies required to treat very sick patients can only be performed at this temple. These ceremonies involve not only the shaman but a permanent group of vestal maidsens who move sedately about the temple chambers in distinctive costume and headdress.

The latipso ceremonies are so harsh that it is phenomenal that a fair proportion of the really sick natives who enter the temple ever recover. Small children whose indoctrination is still incomplete have been known to resist attempts to take them to the temple because "that is where you go to die." Despite this fact, sick adults are not only willing but eager to undergo the protracted ritual purification, if they can afford to do so. No matter how ill the supplicant or how grave the emergency, the guardians of many temples will not admit a client if he cannot give a rich gift to the custodian. Even after one has gained admission and survived the ceremony, the guardians will not permit the neophyte to leave until he makes still another gift.

The supplicant entering the temple is first stripped of all his or her clothes. In every-day life the Nacirema avoids exposure of his body and its natural functions. Bathing and excretory acts are performed only in the secrecy of the household shrine, where they are ritualized as part of the body-rites. Psychological shock results from the fact that body secrecy is suddenly lost upon entry into the latipso. A man, whose own wife has never seen him in an excretory act, suddenly finds himself naked and assailed by a vestal maiden while he performs his natural functions into a sacred vessel. This sort of ceremonial treatment is necessitated by the fact that the excreta are used by a diviner to ascertain the course and nature of the client's sickness. Female clients, on the other hand, find their naked bodies are subjected to the scrutiny, manipulation, and prodding of the medicine men.

Few applicants in the temple are well enough to do anything but lie on their hard beds. The daily ceremonies, like the rites of the holy-mouth-men, involve discomfort and torture. With ritual precision, the vestals awake their miserable charges each dawn and roll them about on their beds of pain while performing ablutions, in the formal movements of which the maidsens are highly trained. At other times they insert magic wands in the supplicant's mouth or force him to eat substances which are supposed to be healing. From time to time the medicine men come to their clients and rub magically treated medicines into their flesh. The fact that these temple ceremonies may not cure, and may even kill the aeophyte, in no way decreases the people's faith in the medicine men.

There remains one other kind of practitioner, known as a "listener." This witch-doctor has the power to exorcise the devils that lodge in the heads of people who have been bewitched. The Nacirema believe that parents bewitch their own children. Mothers are particularly suspected of putting a curse on children while teaching them the secret body rituals. The counter-magic of the witch-doctor is unusual in its lack of ritual. The patient simply tells the "listener" all his troubles and fears, beginning with the earliest difficulties he can remember. The memory displayed by the Nacirema in these exorcism sessions is truly remarkable. It is not uncommon for the patient to bemoan the re-
jection he felt upon being weaned as a baby, and a few individuals even see their troubles going back to the traumatic effects of their own birth.

In conclusion, mention must be made of certain practices which have their base in native esthetics but which depend upon the pervasive aversion to the natural body and its functions. There are ritual fasts to make fat people thin and ceremonial feasts to make thin people fat. Still other rites are used to make women's breasts large if they are small, and smaller if they are large. General dissatisfaction with breast shape is symbolized in the fact that the ideal form is virtually outside the range of human variation. A few women afflicted with almost inhuman hypermannary development are so idolized that they make a handsome living by simply going from village to village and permitting the natives to stare at them for a fee.

Reference has already been made to the fact that excretory functions are ritualized, routinized, and relegated to secrecy. Natural reproductive functions are similarly distorted. Intercourse is taboo as a topic and scheduled as an act. Efforts are made to avoid pregnancy by the use of magical materials or by limiting intercourse to certain phases of the moon. Conception is actually very infrequent. When pregnant, women dress so as to hide their condition. Parturition takes place in secret, without friends or relatives to assist, and the majority of women do not nurse their infants.

Our review of the ritual life of the Nacirema has certainly shown them to be a magic-ridden people. It is hard to understand how they have managed to exist so long under the burdens which they have imposed upon themselves. But even such exotic customs as these take on real meaning when they are viewed with the insight provided by Malinowski when he wrote (1948:70):

Looking from far and above, from our high places of safety in the developed civilization, it is easy to see all the crudity and irrelevance of magic. But without its power and guidance early man could not have mastered his practical difficulties as he has done, nor could man have advanced to the higher stages of civilization.

REFERENCES

