Linguistics 567, Spring 2005, Jonathan Pool
Lab 8 (Esperanto)

***Coordination Facts***

*Conjunctions*

Conjunctions used in coordination in Esperanto are mainly "kaj" ('and'), "aŭ" ('or'), and "nek" ('nor'). The combined conjunction "kaj/aŭ" ('and/or') is also found.

*Unmarked Patterns*

Esperanto's unmarked coordination patterns are as follows.

For "and" coordination, "kaj" ('and') is interposed between the last two coordinands, as in:

(1)  mi havas     hundon  kaj katojn
     I  have-PRES dog-ACC and cats-ACC
     I have a dog and cats

     mi havas     hundon  serpentojn kaj katon
     I  have-PRES dog-ACC snakes-ACC and cat-ACC
     I have a dog, snakes, and a cat

For "or" coordination, the word "aŭ" ('or') is interposed between the last two coordinands, as in:

(2)  mi aĉetos  hundon  aŭ katojn
     I  buy-FUT dog-ACC or cats-ACC
     I'm going to buy a dog or cats

(3)  mi aĉetos  hundon  serpentojn aŭ katon
     I  buy-FUT dog-ACC snakes-ACC or cat-ACC
     I'm going to buy a dog, snakes, or a cat

For "nor" coordination, the word "nek" ('neither/nor') is inserted before every coordinand, as in:

(4)  mi aĉetos  nek     hundon  nek katojn
     I  buy-FUT neither dog-ACC nor cats-ACC
     I'm going to buy neither a dog nor cats

(5)  mi aĉetos  nek     hundon  nek serpentojn nek katon
     I  buy-FUT neither dog-ACC nor snakes-ACC nor cat-ACC
     I'm going to buy neither a dog nor snakes nor a cat

*Marked Patterns*

There are also marked patterns of "and" and "or" coordination. One is insertion of the conjunction between every pair of adjacent coordinands (marked if there are more than two coordinands), as in:

(6)  mi aĉetos  hundon  kaj serpentojn kaj katon
     I  buy-FUT dog-ACC and snakes-ACC and cat-ACC
     I'm going to buy a dog, snakes, and a cat

(7)  mi aĉetos  hundon  aŭ serpentojn aŭ katon
     I  buy-FUT dog-ACC or snakes-ACC or cat-ACC
     I'm going to buy a dog, snakes, or a cat

Another is insertion of the conjunction before every coordinand (like "nek"), which produces emphatic coordination, as in:

(8)  mi aĉetos  kaj hundon  kaj katojn
     I  buy-FUT and dog-ACC and cats-ACC
     I'm going to buy both a dog and cats

(9)  mi aĉetos  aŭ hundon  aŭ katojn
     I  buy-FUT or dog-ACC or cats-ACC
     I'm going to buy either a dog or cats

*Coordinand Types*

The above-described markers and patterns can apply to coordinands of all head types, both lexical and phrasal, as in:

(10) mi aĉetis   la  flavan        hundon  kaj dolĉajn       katojn
     I  buy-PAST the yellow-SG-ACC dog-ACC and sweet-PL-ACC cats-ACC
     I bought the yellow dog and (the/some?) sweet cats

(11) mi aĉetis   frenezan      kaj tre  dolĉan        hundon
     I  buy-PAST crazy-SG-ACC and very sweet-SG-ACC dog-ACC
     I bought a crazy and very sweet dog

(12) mi rapide   kaj iom           mallogike     decidis
     I  fast-ADV and some-amount-ADV un-logic-ADV decide-PAST
     I made the decision quickly and somewhat illogically

(13) mi aĉetos  kaj amos     la  hundon
     I  buy-FUT and love-FUT the dog-ACC
     I'm going to buy and love the dog

(14) mi aĉetos  la  hundon  kaj konstruos por ĝi     dometon
     I  buy-FUT the dog-ACC and build-FUT for it-NOM house-DIM-ACC
     I'm going to buy the dog and build a little house for it

(15) mi aŭ tuj         antaŭ aŭ dum    marto     aĉetos  la  hundon
     I  or immediately before or during March-NOM buy-FUT the dog-ACC
     I'm going to buy the dog either right before or during March

(16) mi aĉetos  la  hundon  kaj vi      ĝin     edukos
     I  buy-FUT the dog-ACC and you-NOM it-ACC train-FUT
     I'm going to buy the dog and you're going to train it

*Noun-Adjective Coordination*

Coordination interacts with number agreement between adjectives and nouns. As a first approximation, it appears correct to say that any combination of number inflections on adjectives and nouns involved in coordination is grammatical if there is a noncontradictory interpretation for the resulting phrase or clause. Some clearly grammatical examples:

```
(17) tradicia        kaj racia        ideo
     tradition-ADJ-SG and reason-ADJ-SG idea
     a traditional and rational idea

(18) tradiciaj       kaj raciaj       ideoj
     tradition-ADJ-PL and reason-ADJ-PL ideas
     traditional and rational ideas

(19) tradicia        kaj racia        ideoj
     tradition-ADJ-SG and reason-ADJ-SG ideas
     a traditional idea and a (different) rational one

(20) tradiciaj       kaj racia        ideoj
     tradition-ADJ-PL and reason-ADJ-SG ideas
     traditional ideas and a rational one
```

This analysis leads to the unacceptability of any phrase with at least one plural adjective if the noun is singular, such as:

```
(21) *tradiciaj      kaj racia        ideo
     tradition-ADJ-PL and reason-ADJ-SG idea
```

Example 18 may be interpreted to indicate that each idea is both traditional and rational, or that each idea is either traditional or rational but not both, or that each idea is traditional, rational, or both.

The ambiguity of example 18 is eliminated in practice if the adjectives are incompatible, as in:

```
(22) raciaj          kaj malraciaj       ideoj
     reason-ADJ-PL and un-reason-ADJ-PL ideas
     rational and irrational ideas
```

Combining these lines of analysis, we can conclude that there is something wrong with a phrase in which both adjectives and the noun are singular but the adjectives are incompatible, if the conjunction is "kaj" ('and'):

```
(23) ?racia          kaj malracia        ideo
     reason-ADJ-SG and un-reason-ADJ-SG ideas
     a rational and irrational idea
```

while there is no basis for rejection of the same phrase with a disjunctive conjunction:

```
(24) racia           aŭ malracia         ideo
     reason-ADJ-SG or un-reason-ADJ-SG ideas
     a rational or irrational idea
```

Given the gradations of incompatibility among adjectives, it seems unwise to consider the problem with example 23 a grammatical one, however. Example 23 makes a clear but absurd predication, while it isn't clear what predication example 21 makes.

A similar argument can apply to coordinated nouns when an adjectives precedes or follows them. Examples:

```
(25) nova        domo  kaj aŭto
     new-ADJ-SG house and car
     a new house and a car
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(26) novaj     domo  kaj aŭto
     new-ADJ-PL house and car
     a new house and a new car

(27) novaj     domoj  kaj aŭtoj
     new-ADJ-PL houses and cars
     new houses and (new?) cars

(28) novaj     domoj  kaj aŭto
     new-ADJ-PL houses and car
     new houses and a (new?) car

(29) *nova     domoj  kaj aŭto
     new-ADJ-PL houses and car

The ambiguity of example 27 disappears under one alternative word order:

(30) domoj  novaj     kaj aŭtoj
     houses new-ADJ-PL and cars
     new houses and some cars

But no change in word order can force an interpretation of example 27 in which the adjective modifies both nouns. To assure that, one can repeat the adjective.

By contrast, the ambiguity of example 28 disappears under either of two alternative word orders (and there are two more, if one inverts the nouns), each assuring a different interpretation:

(31) domoj  kaj aŭto novaj
     houses and car  new-ADJ-PL
     new houses and a new car

(32) domoj  novaj     kaj aŭto
     houses new-ADJ-PL and car
     new houses and a car

These judgments do not uniformly apply when the conjunction becomes disjunctive. For example, example 26 is grammatical, but its disjunctive counterpart is not:

(33) *novaj     domo  aŭ aŭto
     new-ADJ-PL house or car

Likewise, number combinations that are ambiguous differ between conjunctions. For example, example 25 is unambiguous, requiring the adjective to be interpreted as modifying only the first noun, but the disjunctive counterpart is ambiguous:

(34) nova      domo  aŭ aŭto
     new-ADJ-SG house or car
     a new house or (a?) car

Like example 27, a change in word order can force only one of the interpretations:

(35) domo   nova      aŭ aŭto
     house new-ADJ-SG or car
     a new house or a car

The other interpretation can, as for example 27, be forced with adjective repetition.

One can apply the same argument to coordination of nouns or adjectives when adjectives act as complements. For example:

(36) la  domo  estis malnova      kaj luksa
     the house was   un-new-ADJ-SG and luxury-ADJ-SG
     The house was old and luxurious

(37) *la domo  estis malnova      kaj luksaj
     the house was   un-new-ADJ-SG and luxury-ADJ-PL

(38) la  domoj  estis malnovaj     kaj luksaj
     the houses were  un-new-ADJ-PL and luxury-ADJ-PL
     The houses were old and luxurious

I can find no authority for this (the descriptive grammars pay little attention to coordination, relative to its complexity), but the similarity probably becomes contentious with distributive interpretations, as in:

(39) ?la domoj  estis malnova      kaj luksaj
     the houses were  un-new-ADJ-SG and luxury-ADJ-PL
     Of the houses, one was old and the others were luxurious

(40) ?mi juĝis la akuzitojn kulpaj kaj senkulpa
     I judge-PAST the accuse-PASS-PAST-PART-N-PL-ACC guilt-ADJ-PL-NOM and
     without-guilt-ADJ-SG-NOM
     Of the accused, I found all but one guilty and one innocent

Additional opportunities for marginal acceptability arise when both adjectives and nouns are coordinated, such as:

(38) ?malnova      kaj luksaj      libroj   kaj meblo
     un-new-ADJ-SG and luxury-ADJ-PL book-PL and furniture-SG
     books and a piece of furniture, one being old and the others luxurious

It seems plausible that a few principles could be found that generate the rules for the interaction of coordination and number agreement. One hypothesis could be that coordination phrases have number values based on the conjunction, the head type, and the number values of their coordinands, as follows:

| Head | Conj | Args | Top |
| --- | --- | --- | --- |
| Adj | kaj | sing | underspecified |
| Adj | kaj | mixed | plur |
| Adj | kaj | plur | plur |
| Adj | aŭ | sing | sing |
| Adj | aŭ | mixed | invalid |
| Adj | aŭ | plur | plur |
| Noun | kaj | sing | plur |
| Noun | kaj | mixed | plur |
| Noun | kaj | plur | plur |
| Noun | aŭ | sing | sing |
| Noun | aŭ | mixed | unmodifiable |
| Noun | aŭ | plur | plur |

*Verb Coordination*

Examples 13, 14, and 16 illustrate the coordination of verbal words, phrases, and clauses. In each example, the coordinands are alike with respect to verb features.

Esperanto permits some verb heterogeneity among coordinands. The limits of such heterogeneity are not entirely clear. For example, one can imagine sentential coordination with a declarative clause and a command as coordinands, such as:

```
(39) ?vi      ŝtelis      la lakton   kaj ne  mensogu
     you-NOM steal-PAST the milk-ACC and not lie-IMP
     You stole the milk, and don't lie
```

Generally, however, verbal coordination is considered marginally acceptable or unacceptable when the coordinands differ in their clausal or inflectional type, except for differences within the set of finite-verb inflections. As a first approximation, then, in coordinations, past, present, future, and conditional verbs may be freely combined. But these finite types, imperative verbs, and infinitive verbs may not be coordinated with one another. Even when all coordinated verbs are imperative, if the coordination is clausal then the clauses must all be either imperative clauses (with overt subjects) or commands (with covert second-person subject), but not a mixture of these. Examples:

```
(40) vi       ŝtelis      kaj mi trovos    la  lakton
     you-NOM steal-PAST and I  find-FUT the milk-ACC
     You stole (the milk?) and I'm going to find the milk
```

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(41) *vi      ŝtelis      kaj redonu      la  lakton
     you-NOM steal-PAST and re-give-IMP the milk-ACC
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(42) *vi      ŝtelis      kaj ĉu redonos     la  lakton
     you-NOM steal-PAST and TF re-give-FUT the milk-ACC
```

```
(43) ĉu vi       pentas      kaj redonos     la  lakton
     TF you-NOM repent-PRES and re-give-FUT the milk-ACC
     Do you repent, and are you going to give back the milk?
```

```
(44) *redonu      la lakton    kaj dio vin      pardonu
     re-give-IMP the milk-ACC and god you-ACC pardon-IMP
```

Under this analysis, the coordination of complete questions is possible even if one question's verb is finite and another's is imperative, since the coordinands are complementizer clauses rather than verbs. But, if the complementizer is shared and its complements are coordinated, then finite-imperative mixtures are considered ungrammatical, as in:

```
(45) *ĉu ili  pentas       kaj mi pardonu     ilin
     TF  they repent-PRES and I  pardon-IMP them
```

When a sentence contains a raising verb, either it or its complement or both can be coordinated, as in:

```
(46) mi povas     kaj devas     aĉeti    kaj eduki     tiun      hundon
     I  can-PRES and must-PRES buy-INF and train-INF that-ACC dog-ACC
     I can (do something?) and must buy (something?) and train that dog
```

*Coordination Implementation*

The grammar introduced VFORM as a head-min feature. For coordination, it now also has VCFORM as a head-min feature. VCFORM is a less fine-grained version of VFORM, with only imperative, infinitive, and finite values. The grammar requires verbal coordinands to agree with each other with respect to VCFORM. Imperative and declarative complementizers require their complements to have compatible VCFORM values and copy those to their own HEAD.VCFORM values. Imperative clauses do the same. Headed phrases copy their head daughter's VCFORM value to their own. Verb coordination phrases copy their verb arguments' VCFORM values to their own and require both of their verb arguments to have identical VCFORM values, thereby enforcing the type homogeneity requirement illustrated in examples 40 and 41. These constraints work because the grammar also assigns a value on VCFORM to the mother of each verb inflectional rule.

Verb coordination is also subject to constraints in v-coord-phrase and v-bottom-coord-rule, requiring verbal arguments to have non-empty SUBJ values. This prevents sentential coordination.

The grammar includes a conj-lex type for the conjunction words, complying with the type in the coordination module.

The grammar includes the standard types from the coordination module for languages with mandatory monosyndeton with optional polysyndeton.

The grammar constrains noun coordinations to be uniform with respect to case, as Esperanto requires, by identifying the CASE values of the mother and both daughters in the nom-coord-phrase type, and identifying the CASE values of the mother and the second argument of the np-bottom-coord-rule type. The standard identification of MOD values accomplishes this for adjective coordination.

Noun coordination in this grammar is limited to NP coordination. Thus, sentences where conjoined nouns are modified by single or conjoined adjectives are not parsed. If ambiguous sentences like examples 27 and 28 are parsed, the only parse that the grammar produces is the one in which the adjective modifies the immediately following noun.

The grammar has now added COORDL as a local-min feature. Its possible values express the notions of "top", "middle", "bottom", and "none". Headed phrases, lexical rules, and words are given the "none" value on this feature. The top-coord-rule type's mother is given the "top" value, mid-coord-rule's mother is given the "middle" value, and bottom-coord-phrase's mother is given the "bottom" value on COORDL. This feature is used for the definition of three labels for parse trees, "XT", "XM", and "XB".

*Coverage*

The grammar covers a small enough subset of the coordination facts that it is efficient to specify what it covers rather than what it doesn't cover.

The grammar covers parts of only noun-phrase, adjective, and verb coordination.

Noun-phrase coordination is covered only for fully saturated noun phrases. Thus, the grammar would give only one parse to a sentence like example 10 or a phrase like example 27, rejecting the shared-determiner or shared-adjective interpretation.

Adjective coordination is covered only for uniformly singular or uniformly plural coordinands (i.e. coordinands all of which specify the same number for their modified nouns) that modify nouns of the corresponding number. Thus, the grammar accepts sentences like examples 17 and 18, but not like examples 19 and 20.

Verb coordination is covered only for lexical and phrasal verbs without their subject requirements satisfied. Thus, the grammar does not accept sentences like example 16. The grammar enforces the requirement that coordinated verbs have identical VCFORM values, i.e. that they all be finite, all be infinitive, or all be imperative.

With these restrictions, the grammar covers coordination, with apparently correct parses, MRS semantic representations, and sentence generation.

As an example that combines several types of coordination, consider:

(47) hundoj nigraj kaj flavaj kaj dolcxaj kaj frenezaj katoj povas kaj devas
     kuiri kaj mangxi panon kaj harojn
     dogs-NOM black-PL-NOM and yellow-PL-NOM and sweet-PL-NOM and crazy-PL-
     NOM cats-NOM can-PRES and must-PRES cook-INF and eat-INF bread-ACC and
     hairs-ACC
     Black and yellow dogs and sweet and crazy cats can and must cook and eat
     bread and hair

The translation shown for example 47 does not attempt to disambiguate this example. One, two, or three of the adjectives can be attached to "hundoj". The raising verb "povas" can have an omitted complement or be coordinated with "devas" before complementation. The verb "kuiri" can have no complement or be coordinated with "manĝi" before complementation. These alternatives combine to make this sentence subject to 12 alternative parses. The grammar delivers 20 parses, covering these 12 plus others caused by alternative binary groupings of adjectives. For example, "black and yellow and sweet" can be grouped "[black and yellow] and sweet" or "black and [yellow and sweet]". The indexed MRS for one of the parses selected for inspection looks correct. The sentences generated from the MRS of a similar but simpler sentence appeared to be correct.

***To do***

Study apparent nominal modification by scopal adverbs, such as "eĉ hundo" ('even a dog'), "ne mi" ('not I'), and "nur lingviko" ('only linguistics'), to choose an analysis for implementation.

Investigate conditional permission to intersectal adverbs to modify constituents on their left.

Investigate Emily Bender's advice to amend "verb-lex" to identify subject's INDEX with verb's own XARG, which should eliminate the need to identify the #sj values in raising-verb-lex.

Study coordination of lexical nouns and unsaturated noun phrases for implementation.

Study number-heterogeneous adjective coordination for implementation.

Study sentential coordination for implementation.

Begin testing with itsdb.