Lecture Notes
Chapter 9, "Componential Analysis"

Linguistics 3430
Fall 2007

Background. In this chapter and the two the follow it, we are introduced to three specific frameworks for semantic analysis: componential analysis, formal semantics and cognitive semantics. Componential analysis is the most general of the three models. It says that we can describe meanings, meaning relationships (like entailment) and the grammatical behavior of word classes by analyzing word meanings into **meaning components**. Some of these meaning components correspond to words of the language and some do not. This analysis procedure is called **lexical decomposition**. Here are two basic reasons that we might want to use lexical decomposition.

- **Lexical decomposition can be used to describe the basic components of human conceptual structure**:
    - **Natural Semantic Metalanguage** (NSM; Goddard and Wierzbicka 2007): the components that linguists have traditionally used to perform componential analysis don't reflect 'indigenous conceptualizations'. For example, componential analyses of the terms *man*, *woman* and *child* typically involve concepts for which not all languages have words: male, female, adult.
    - Here are the concepts that NSM thinks are universal:
        - Substantives: I, YOU, SOMEONE, SOMETHING/THING, PEOPLE, BODY
        - Relational substantives: KIND, PART
        - Determiners: THIS, THE SAME, OTHER/ELSE
        - Quantifiers: ONE, TWO, MUCH/MANY, SOME, ALL
        - Evaluators: GOOD, BAD
        - Descriptors: BIG, SMALL
        - Mental predicates: THINK, KNOW, WANT, FEEL, SEE, HEAR
        - Speech: SAY, WORDS, TRUE
        - Actions, events, movement, contact: DO, HAPPEN, MOVE, TOUCH
        - Location, existence, possession, specification: BE (SOMEWHERE), BE/EXIST, HAVE, BE (SOMEONE/SOMETHING)
        - Life and death: LIVE, DIE
        - Time: WHEN/TIME, NOW, BEFORE, AFTER, A LONG/SHORT TIME, FOR SOME TIME, MOMENT/IN ONE MOMENT
        - Space: WHERE/PLACE, HERE, ABOVE, BELOW, NEAR, FAR, SIDE, INSIDE
        - Logical concepts: NOT, MAYBE, CAN, BECAUSE, IF
        - Intensifier, augmentor: VERY, MORE
        - Similarity: LIKE/AS
    - Here is the NSM definition of *children*:
        - *children*
            - people of one kind
            - people of this kind have lived for a short time, not a long time
            - because of this, their bodies are small
            - when people are like this, they can do some things, they can't do many other things

- because of this, if other people don't do some good things for them, bad things can happen to them
- all people are like this for some time before they can be not like this

- **Lexical decomposition can help us describe ambiguities that are otherwise mysterious:**

She dug it up and buried it ***again****.*
He spat ***on the sidewalk****.*
They put the champagne in the freezer ***for five minutes****.*
I ***almost*** *fixed the furnace yesterday.*

1. Meaning components and word relations. Many semanticists represent meaning components as features, in order to capture taxonomic relations among words:

- Some view meaning components as binary features; this allows one or more words in a taxonomy to be *unmarked* with regard to a given feature:

horse	[+animate, +quadruped, +equine, +adult, ±female]
mare	[+animate, +quadruped, +equine, +adult, +female]
stallion	[+animate, +quadruped, +equine, +adult, -female]
foal	[+animate, +quadruped, +equine, -adult, ±female]
colt	[+animate, +quadruped, +equine, -adult, -female]
filly	[+animate, +quadruped, +equine, -adult, +female]

Entailment. A colt is a quadruped, equine, etc.
Hyponymy. A mare is a kind of horse.
Contradiction. A mare cannot not be a horse.

- Some divide meaning components into **semantic markers** (...) and **distinguishers** [...]. Types of ballistic actions:

Punch.	(action) (momentaneous) (make physical contact) [using fist]
Slap.	(action) (momentaneous) (make physical contact) [using open hand]
Poke.	(action) (momentaneous) (make physical contact) [depressing surface] [with 1-D object]
Bite.	(action) (momentaneous) (make physical contact) [holding fold of tissue] [with jaws]
Pinch.	(action) (momentaneous) (make physical contact) [holding fold of tissue] [with fingers]

2. Meaning components and grammatical behavior of verbs and verb classes. Certain grammatical constructions are restricted to certain semantic classes of verbs. Can we express generalizations about these classes using componential analysis?

- Levin uses semantic features to describe the interaction between three constructions and four classes of verbs, represented by *cut, break, touch,* and *hit.*

(1) **The Middle Construction**

a. This bread cuts easily.
b. Crystal vases break easily.
c. *Velvet touches easily.

d. *Door frames hit easily.

(2) **The Conative Construction**

a. Margaret cut at the bread.
b. *Janet broke at the vase.
c. *She touched at the cat.
d. Carlo hit at the barrier.

(3) **The Possessor Ascension Construction**

a. Margaret cut Bill on the arm.
b. *Janet broke Bill on the finger.
c. Terry touched Bill on the shoulder.
d. Carlo hit Jerry in the gut.

- Levin describes the four verb classes as follows. Meaning components are in caps.

1. *Cut* type (*scratch, hack, claw, poke*): CHANGE, CONTACT, MOTION
2. *Break* type (*break, crack, snap, shatter, rinse, fold*): CHANGE
3. *Touch* type (*stroke, tickle, rub*): CONTACT
4. *Hit* type (*punch, tap, whack*): CONTACT, MOTION

- Generalizations.

The Middle construction requires the feature CHANGE
The Conative requires (potential) CONTACT, MOTION
The Possessor Ascension construction requires. CONTACT

- **Linking alternations**. When there are two possible arguments structures for verbs of a given semantic class, invariably some verbs in the class alternate and some verbs in the class have only one or the other of the two argument-structure possibilities.

Transfer verbs

(4) a. I sprayed the clover with insecticide.
b. I sprayed insecticide on the clover.
(5) a. I poured oil into the pan.
b. *I poured the pan with oil.
(6) a. I soaked the sponge with disinfectant.
b. *I soaked disinfectant onto the sponge.

The POUR class. Cause something to move to a new location
The SOAK class. Cause something to change state by moving something to it
The SPRAY class. NEUTRAL PERSPECTIVE

Verbs of removal

(7) a. I cleared the glasses from the bar.
b. I cleared the bar of glasses.
(8) a. I wiped the lipstick from the glass.
b. I removed the empties from the crate.
c. *I wiped the glass of lipstick.

d. *I removed the crate of empties.

The REMOVE class. Cause something to go away from something else.
The CLEAR/DRAIN class. Cause a change in something by taking something away from it.

3. Meaning components and linguistic typology: lexicalization patterns. Talmy distinguishes groups of languages with regard to how they express motion events in sentences. He does this by comparing the components of the motion event that each language puts into the verb versus 'satellite' expressions (noun phrases, preposition phrases and adverbial phrases).

- To describe lexicalization patterns, Talmy uses five **meaning components**:

  1. **Figure**. The item which moves or is located with respect to something else.
  2. **Ground**. The landmark with respect to which the Figure is located or moves.
  3. **Motion**. The motion event or location state.
  4. **Path**. The course followed by a Figure in motion or the area occupied by a Figure in a static configuration.
  5. **Manner**. The manner or means of the motion or location.

- Example1. *Harry swam around the reef.*
- Example2: *Harry spat into the spittoon.*

- Romance languages and Germanic languages differ with regard to the way in which they fold these meaning components into verb meanings.

- Lexicalization of **manner** and **path**: Spanish vs. English

(9) a. *Subió las escaleras corriendo.*
a'. 'He ascended the stairs running.'
b. He ran up the stairs.

(10) a. *Salió de la casa corriendo.*
a'. 'He exited the house running'.
b. He ran out of the house.

(11) a. *Metí el barril a la bodega rodandolo.*
a'. 'I placed the barrel in the storeroom by rolling it.'
b. I rolled the barrel into the storeroom.

(12) a. *Quité el papel del paquette cortandolo.*
a'. 'I removed the paper from the package by cutting.'
b. I cut the paper off the package.

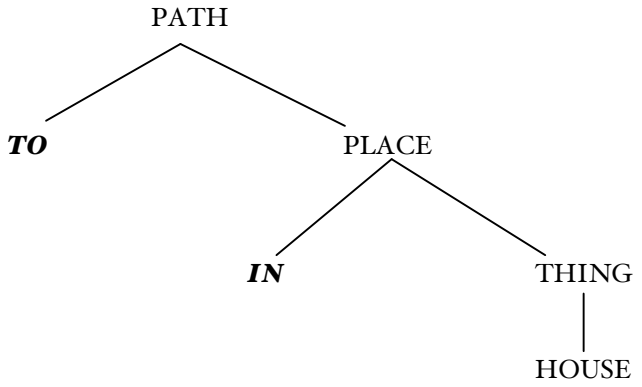
What is the generalization about the difference between Spanish and English with regard to the lexicalization pattern of motion events?

4. Meaning components and conceptual building blocks. Jackendoff describes an inventory of universal semantic categories, from which all sentence meanings can be formed.

EVENT
STATE

THING
PATH
PLACE
PROPERTY
TIME

- Conceptual structures are represented as combinations of these categories.



- These combinations contain **functions** (shown in bold italics), which allow one category to be derived from another (pp. 251-253).

- Among the functions are CAUSE and INCH, which allow for the formation of **achievement-type events** from **states** and of **accomplishment-type events** from **inchoatives** (p. 253, 9.88-9.89).

  STATE
  INCH (STATE) = achievement
  CAUSE (INCH (STATE)) = accomplishment

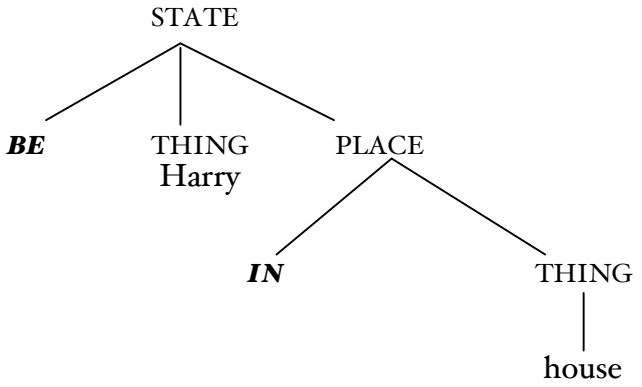


Figure 1. The state 'Harry is in the house'

Notice that the stative operator **BE** has two arguments: Harry and his location.

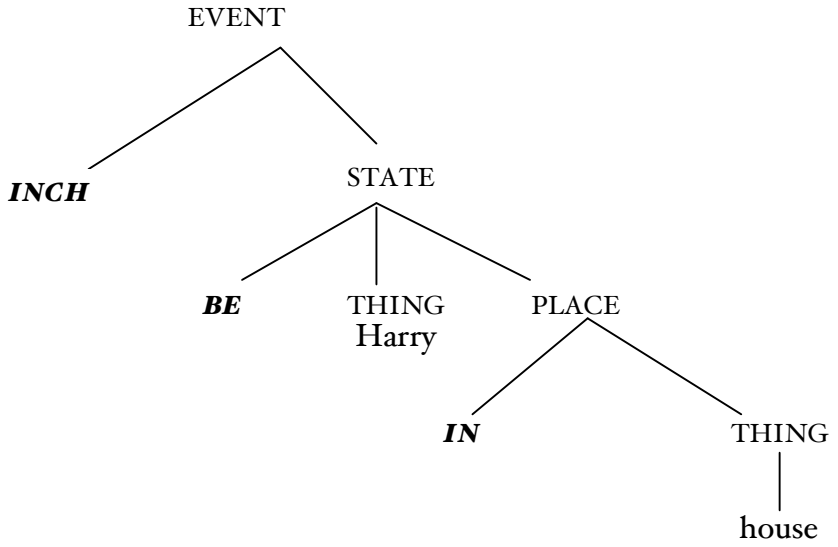


Figure 2. The achievement (inchoative event) 'Harry arrived at the house'

Notice that the operator **INCH** takes the whole representation from Figure 1 as its argument. In other words, Figure 2 **incorporates** Figure 1.

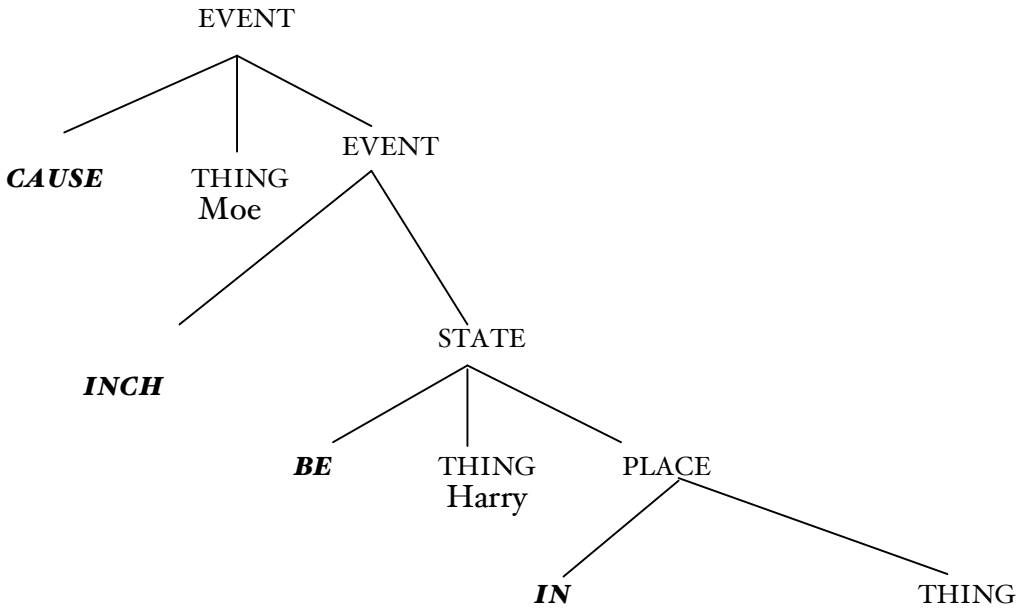


Figure 3. The accomplishment (causative event) 'Moe took Harry home'

Notice that that this representation has the most complex structure of all three. The operator **CAUSE** takes two arguments. The first argument is the agent, *Moe*. The second argument is an event. This event is an inchoative event. It is identical to that represented in Figure 2. So, Figure 3 incorporates Figure 2, which in turn incorporates Figure 1.

- Just as there are different types of events, there are different types of **things**. Two binary features are used to make distinctions among things:
  - [±bounded]: does the entity have external boundaries?
  - [±internal structure]: does the entity consist of individuals?

  1. **Individuals** (*a banana*) count nouns [+b,-i]
  2. **Groups** (*a committee, a government*) collective nouns[+b,-i]
  3. **Substances** (*water, pudding*) mass nouns [-b,-i]
  4. **Aggregates** (*bananas, cars*) plural nouns [-b,+i]

- Semantic functions allow for conceptual shifts in the designation of the noun:

  (1) **Individual to aggregate**: brick [+b, -i] → bricks [-b,+i]
  (2) **Individual to aggregate to a portion**:

  a muffin [+b, -i] → (***PLURAL***) muffins [-b, +i] → (***COMPOSE***) a batch of muffins [+b,+i]

  He coughed [+b, -i] → (***PLURAL***) He coughed constantly [-b,+i] → (***DURATION***) He coughed constantly throughout the night [+b,+i]

  (3) **Individual to substance**:

  They saw a **lamb** [+b, -i] → (***GRIND***) They ate **lamb** [-b,-i] ('universal grinder')

  (4) **Substance to individual**:

  There was **beer** on the floor [-b,-i] → (***PACKAGE***) She had **a beer** [+b,-i] ('universal packager')

5. Meaning components used to describe the polysemy of adjectives and verbs.

Pustejovsky is interested in how verbs and adjectives change meaning according to the nouns with which they are combined. Here are two pairs of examples:

- **Verbs**

  She baked a cake.
  She baked a potato.

- **Adjectives**

  She is a good driver.
  That's a good knife.

He describes these meaning shifts in terms of properties of the noun (called **qualia**; singular ***quale***) that the verb or adjective can select. There are four qualia:

- **Constitutive**. What an object is made of.
- **Formal**. External properties of the object: shape, color, dimensionality, orientation.
- **Telic**. The purpose and function of the object.
- **Agentive**. The means by which the object is brought into being (e.g., the distinction between natural kinds and artifacts).

Analyses

- The verb *bake* means 'cause to become edible by dry heat'. The words *cake* and *potato* differ with regard to their agentive qualia: *cake* is an artifact while *potato* is a natural kind. Therefore, to cause a cake to become edible means causing it to come into being.
- The interpretation of *good* differs for *driver* and *knife* because the two entities have different telic properties: a knife separates things into even segments and a driver guides a vehicle through traffic.

6. Hints about problems 9.2-9.3 and 9.6.

- **9.2-9.3**. Steven Pinker uses a verb's semantic class to predict it ability to form a ditransitive sentence, e.g., *Harry gave Bob the book*. In 9.2 and 9.3 you will test whether Pinker's predictions about verbs are correct. To do this, you need to do three things: (1) determine the semantic class of each verb, (2) test whether that verb can appear in a ditransitive sentence (use your own judgment to determine whether the sentence is a well-formed sentence or not), and (3) draw a conclusion about whether Pinker's prediction was correct in the case of each verb. Make sure that you determine the verb's semantic class *before* testing it in a ditransitive pattern. Once you have discovered that the verb does (or does not) appear in the ditransitive pattern, do not go back and change its semantic class to fit Pinker's prediction. Instead, comment on whether Pinker's prediction is confirmed or disconfirmed in this case. There are two cases that disconfirm Pinker's hypotheses: **negative exceptions** (Pinker predicts the verb will form a ditransitive and it actually does **not**) and **positive exceptions** (Pinker predicts that the verb will not form a ditransitive, and it does).
    - For example, in 9.2, you are asked to test the verb *ferry* (as in, e.g., *The shuttle ferries passengers from the hotel to the airport*). You use the semantic criteria for class membership in classes 1a-b vs. 2 and determine that *ferry* is a class 2 verb (X moves Y to Z in a certain manner). A good way check whether a verb is a class 2 verb is whether its frame requires a *recipient*, rather than just a goal. The verb *ferry* clearly doesn't require anyone to receive the goods or people carried on the boat, so this is evidence that it belongs to class 2. Can *ferry* form a ditransitive sentence? I will test this by using the sentence **The Coast Guard ferried the Katrina victims some supplies*. I think this is a bad sentence, and so I mark it as such with a *. Now, is Pinker right or wrong about *ferry*? He's right, because he predicts that class 2 verbs will **not** be usable in the ditransitive pattern, and I have confirmed this with my bad sentence.
- **9.6**. In this problem you will again be testing a hypothesis: Croft's causal relations hypothesis. Croft claims that a verb can express both manner and motion in a sentence **only if the manner can be construed as the means by which the motion occurs**. For example, in the case of *They danced into the room*, dancing is a manner of motion but also the means by which the motion occurs, so the sentence is (correctly) predicted to be acceptable. By contrast, in the sentence **The bird chirped out the window,* chirping cannot be construed as the means by which the flight occurs, so the sentence is (correctly) predicted to be weird. In this problem, assume (a) that all of verbs in the example sentences express both manner and motion and (b) that all of the sentences are acceptable sentences of English. Your job for each sentence is (a) to determine whether Croft's prediction is upheld and (b), in the case of **positive exceptions** to Croft's prediction, to explain why the sentence seems to be good despite the fact that it is a violation of Croft's principle. For example, for (g), *The jet flashed across the sky*, you would state that Croft's prediction is violated, and then explain why you believe it is violated: flashing is the *manner* in which the jet flies (it emits light periodically as it flies), but

flashing is not the *cause* of the jet's flight. Then you must briefly explain why you think this sentence is acceptable despite violating the Croft principle. My own view is that the sentence is acceptable because it does express means—the mean by which a viewer would *detect* the motion.