Course LSA 116 UC Berkeley
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Lexical Semantics of Verbs I: Introduction and Role-Centered Approaches to Lexical Semantic Representation

Part I: Introduction

The Big Questions:
How do we discover meaning of verbs? → The major focus here.
How do we represent meaning of verbs? → The secondary focus.

1 The Foundational Assumption: Verb Meaning Provides a Key to Verb Behavior

Why is a theory of verb meaning important? Verbs name events or states with participants, making them the organizational core of the sentence, so their meaning is key to sentence meaning.

Word meanings in general are difficult to pin down, and verb meanings are no less so.
How do we study verb meanings?

ONE STRATEGY: Exploit the link between verb meaning and argument realization.

WHY IS THIS STRATEGY PRODUCTIVE? To the extent that a verb's meaning appears to determine its argument realization options, looking at verbs with shared or overlapping patterns of argument realization provides a way of isolating linguistically-relevant components of verb meaning.

LIMITATION: illuminates only facets of verb meaning relevant to argument realization.

1.1 Support for this strategy: Novel English denominal verbs

The argument realization options of new denominal verbs provide support for the foundational assumption that verb meaning determines verb behavior.

• A case study of texting and faxing:

(1) a. He texted/faxed the answer.
b. The librarian wanded the barcode.

(2) Double object construction:

a. He texted/faxed me the answer
b. $*$ The librarian wanded me the barcode.

(3) a. *text* and *fax* are verbs of information transfer
b. *wand* is not a verb of information transfer

(4) He mailed/radioed/cabled/telexed/e-mailed me the answer.

• A second case study: nonce verbs derived from names of instruments used for removing

(5) a. The mockingbird pounces, TWEEZERS it [=the cricket] from the grass with a sharp and deadly accurate bill . . . (M. Maron, *Southern Discomfort*, The Mysterious Press, New York, 1993, p. 1)

b. Carefully he RAZORED the heads off the matches . . .
(B. Thoene, *Warsaw Requiem*, Bethany, Minneapolis, 1991, p. 187)

Compare established verbs of removing, whether denominal or not:

(6) a. He hosed/raked/shovelled/vacuumed the debris off the sidewalk.

b. He scrubbed/swept/washed the debris off the sidewalk.

Compare denominal verbs based on names of devices for attaching:

(7) He nailed/thumbtacked/stapled/pinned the notice **to** the wall.

1.2 Challenges in identifying meaning components

The relevant meaning components may not always be readily identifiable:
— there may be several overlapping semantic characterizations;
— the correct characterization may not be the most obvious one.

The Italian verbs *russare* 'snore' and *arrossire* 'blush' are both bodily process verbs, yet they select different auxiliaries in Italian:

(8) *russare* 'snore' takes the auxiliary *avere*
arrossire 'blush' takes the auxiliary *essere*

In fact, these verbs are fundamentally different semantically:

(9) *russare* 'snore': activity/process
arrossire 'blush' (= *a* + *rosso* + *ire* 'become red'): change of state

(10) AUXILIARY SELECTION:
Activity/process verbs take the auxiliary *avere* 'have'
State and change of state verbs take the auxiliary *essere* 'be'

1.3 A verb's meaning encodes a specific conceptualization of an event

The assumption that there is a verb meaning–verb behavior connection is not uncontroversial, though it is compelling.

Potential counter-examples: *buy/sell, please/like, fear/frighten*.

Most cited counter-examples can be defused: they involve pairs of verbs that DO differ in meaning: they may lexicalize different perspectives on an event, different construals of an event, or simply different events.

AN EXAMPLE OF A DIFFERENCE IN EVENT CONSTRUAL:
Differences in the behavior of certain translation equivalents.

Italian conceptualizes 'blush' as a change of state, but Dutch conceptualizes it as an activity.
Evidence: like activity verbs, Dutch *blozen* 'blush' selects the auxiliary *hebben* 'have'.

(11) a. J heeft een uur lang gebloosd
'J has one hour long blushed'

b. ∗ J heeft in een uur gebloosd
'J has in one hour blushed' (McClure 1990: 314, Table 4)

This particular event is open to alternative construals, so that languages may lexicalize it in different ways, giving rise to translation equivalents with distinctive behavior.

A SECOND ILLUSTRATION OF DIFFERENCES IN EVENT CONSTRUAL:
Differences in the behavior of certain near-synonyms.

(12) a. She shook./I shook her.

b. She shuddered./*I shuddered her.

(13) a. Things that *shudder*: people, animals, earth, machines/engines
(have "self-controlled bodies")

b. Things that *shake*: the above and leaves, furniture, dishes, ...

Near-synonyms might differ precisely in linguistically relevant facets of meaning:
shake denotes an event that can be 'externally caused'
shudder denotes an event that is 'internally caused'

THE LESSON: It is important to identify the relevant conceptualization of any event in the world that is open to multiple construals since it affects the behavior of the verb naming this event.

1.4 What argument realization properties illuminate the relevant meaning components?

Notions such as "subject", "object", and "transitive" alone are not very revealing.
A variety of verbs are transitive, and their objects bear a range of semantic relations to the verb.

(14) The engineer built the bridge. (effected object/factitive)
The engineer destroyed the bridge. (consumed object/patient)
The engineer widened the bridge. (patient)
The engineer moved the bridge. (theme)
The engineer washed the bridge. (location/surface)
The engineer crossed the bridge. (location)
The engineer reached the bridge. (goal)
The engineer left the bridge. (source)
The engineer saw the bridge. (object of perception)
The engineer hated the bridge. (stimulus)
The engineer avoided the bridge. (?)
The engineer studied the bridge. (?)

Phenomena that make finer grained distinctions:
— Argument (diathesis) alternations within a language. → The focus here.
— Cross-linguistic variation in argument realization. → Some discussion.
— Derivational morphology (Foley & Van Valin 1984; Koontz-Garboden & Levin 2005; Van Valin 2006; RH&L 1998).

1.5 Overview of the lectures

2 A case study: Hitting and Breaking

Fillmore's well-known study, "The Grammar of *Hitting* and *Breaking*" (1970), shows how examining verb behavior can provide insight into verb meaning via a case study of two verbs. This study also introduces two important semantic verb classes.

• *break* and *hit* pattern together in some ways: both are transitive and take instrument *with* phrases.

(15) a. The boy broke the window with a ball.
b. The boy hit the window with a ball.

• But not in all ways: There are divergences in their argument realization options.

(16) Availability of the causative alternation:

a. The boy broke the window. (*break*-transitive: 'cause to *break*-intransitive')
The window broke.

b. The boy hit the window.
∗ The window hit.

(17) Availability of stative adjective:

a. The window was broken. (stative and eventive readings)

b. The window was hit. (eventive reading only)

(18) Availability of body-part possessor ascension:

a. I broke his leg./*I broke him on the leg.

b. I hit his leg./I hit him on the leg.

(Fillmore 1970: 126, (23)–(26))

(19) Availability of the *with*/*against* alternation:

a. Perry broke the fence with the stick.
Perry broke the stick against the fence. (sentences are not near-paraphrases)

b. Perry hit the fence with the stick.
Perry hit the stick against the fence. (sentences are near-paraphrases)

(Fillmore (1977a: 74–78)

• THE QUESTIONS: Why do these two verbs show divergent behavior?
Why do the divergences take the forms that they do?

The verbs *break* and *hit* are each representative of a larger semantically identifiable class of verbs.

(20) a. *Break* Verbs: bend, fold, shatter, crack (Fillmore 1970: 125, (15))
→ verbs of change of state

b. *Hit* Verbs: slap, strike, bump, stroke (Fillmore 1970: 125, (16))
→ verbs of surface contact

Each set shows semantic coherence:
— *break* verbs involve a change of state in an entity,
— *hit* verbs involve contact, often forceful, with an entity, without entailing a change in its state.

(21) a. The rocks hit the windshield, but luckily it wasn't damaged.

b. # The rocks broke the windshield, but luckily it wasn't damaged.

• The fact that classes of verbs with similar meanings show characteristic argument realization patterns suggests the patterns can be attributed to facets of meaning common to class members.

• Further support: comparable classes of verbs, again with distinct behavioral patterns, can be identified in other languages, such as Lhasa Tibetan (DeLancey 1995), Berber, Warlpiri, and Winnebago (Guerssel et al. 1985).

CONSEQUENCE: Common characterization of both verbs as "agent-act-on-patient" is inadequate.

SUMMARY:
Fillmore's case study shows how semantic and syntactic properties of a verb are not idiosyncratic, but may be attributed to an entire class.

3 Moving beyond Fillmore's "The Grammar of *Hitting* and *Breaking*"

• Many subsequent studies—both large- and small-scale—have confirmed and extended Fillmore's findings (e.g., Dixon 1991, Faber & Mairal Usón 1999, Green 1974, Gruber 1967, Jackendoff 1990, Koenig et al. 2008, L&RH 1991, Viberg 2001, Willems 1981, Zwicky 1971).

AN EXAMPLE: My book *English Verb Classes and Alternations* (1993) classifies verbs in two ways:

• according to their SEMANTIC CONTENT: manner of motion verbs, directed motion verbs, sound verbs, change of state verbs, perception verbs, verbs of gestures and sign, weather verbs, ...

⇒ yields a fairly fine-grained semantic classification: 48 broad classes or 192 smaller classes.

• according to their PARTICIPATION IN ARGUMENT ALTERNATIONS: causative alternation, conative alternation, dative alternation, locative alternation, *with/against* alternation, ...

⇒ yields a coarser-grained semantic classification, which appears to have more grammatical relevance than the other (e.g., Fillmore's *hitting* and *breaking* study): 79 alternations.

4 Problems for efforts to identify verb classes

Assuming that limitations of coverage in existing work can be addressed, perhaps in part by using computational tools (Kipper et al. 2008, Korhonen & Briscoe 2004), there are larger issues facing efforts to identify and exploit verb classes.

— Choosing among various ways of defining verb classes:
  – Determining the phenomena to be used in their definition.
  – Determining the best grain-size for verb classes.
— Dealing with the many instances of apparent multiple verb class membership.

4.1 Relating verb classes defined by argument alternations to "Fillmorean" verb classes

An argument alternation by its very nature defines a verb class: The verbs showing the alternation.

QUESTION: How do such verb classes relate to the "Fillmorean" verb classes, which are defined by members with shared meaning and shared behavior?
ANSWER: Generally, classes of alternating verbs include several Fillmorean classes.

AN EXAMPLE: The English dative alternation

(22) a. Terry gave Sam an apple. (double object construction)
  b. Terry gave an apple to Sam. (*to* construction)

(23) Verbs found in the double object construction (based on Gropen et al. 1989: 243–244):

  a. *give* VERBS: give, pass, hand, sell, pay, trade, lend, loan
  b. VERBS OF FUTURE HAVING: advance, allocate, allot, allow, assign, award, bequeath, forward, grant, guarantee, leave, offer, promise
  c. *send* VERBS: mail, send, ship
  d. *throw* VERBS: fling, flip, kick, lob, shoot, slap, throw, toss
  e. VERBS OF CONTINUOUS CAUSATION OF ACCOMPANIED MOTION IN A DEICTICALLY SPECIFIED DIRECTION: bring, take

  ("benefactive" and manner of speaking/communication verbs omitted for simplicity.)

• There is an intuition that the subclasses of alternating verbs do not have the same status, in that one subclass may be felt to represent the "core" alternating verbs.

EXAMPLE: For the dative alternation, the *give* verbs are taken to be the core verbs.

What is behind the intuition of a set of "core" alternating verbs?

— In the construction grammar literature, the "core" verbs include those whose own meaning is said to mirror the meaning of the construction (Goldberg 1995).

— Crosslinguistically, members of the "core" class display the alternation across languages, while members of other classes need not (Croft et al. 2001, RH&L 2008 on the dative alternation; Hirschbühler 2003, Kim 1999 on the locative alternation).

EXAMPLE: Based on data from English, Icelandic, German, Dutch, Croft et al. (2001) propose a ditransitivity hierarchy involving three verbs chosen from major dative alternation subclasses.

(24) Ditransitivity Hierarchy: 'give' < 'send' < 'throw'

(25) If a verb on the right of the hierarchy is found in the double object construction or one of its counterparts, then the verbs to its left are too.

• Certain verb properties, e.g., participation in argument alternations, crosscut Fillmorean classes.

The observation that the "dative alternation verbs" and comparable classes are not coextensive with a Fillmorean class means that there are generalizations which cannot be stated in terms of notions such as "change of state verb" or "manner of motion verb", as they may crosscut such classes.

IMPLICATION: Fillmorean classes are not primitive; verb class effects are in some sense derived.

THE LESSON: The two dimensions of lexical organization—verb classes and argument alternations—lead to distinct and different-sized verb classes; see also Boas (2006).

4.2 Multiple verb class membership and its consequences

• If the level of classification represented by Fillmorean classes is privileged, as existing work seems to take it to be, then verbs with membership in more than one such class might be expected to be the exception, as considerable overlap among such classes would diminish their value.

• Yet, a considerable number of verbs have complex patterns of behavior which are best understood if multiple verb class membership is posited.

A CASE STUDY: Cooking verbs (Atkins, Kegl & Levin 1988)

• Cooking verbs show an unexpected set of properties if a verb's meaning determines its behavior.

(26) COOKING VERBS: **bake**, boil, cook, fry, poach, roast, steam, stew, toast, ...

a. Causative alternation:
Sam baked the apples at 375F./The apples baked at 375F.

b. Unspecified object alternation:
Sam bakes bread on Tuesdays./Sam bakes on Tuesdays.

c. Benefactive alternation:
Sam baked a birthday cake for Chris./Sam baked Chris a birthday cake.

• The problem in a nutshell:

	bake	*carve*	*break*
Causative alternation:	yes	no	yes
Unspecified object alternation:	yes	yes	no
Benefactive alternation:	yes	yes	no

(27) CHANGE OF STATE VERBS (i.e. *break* verbs): bend, **break**, close, crack, darken, dry, freeze, lengthen, melt, open, redden, ripen, shatter, shorten, split, ...

a. Causative alternation:
Sam broke the glass./The glass broke.

b. Unspecified object alternation:
Sam broke the glass./*Sam breaks on Thursdays.

c. Benefactive alternation:
Sam broke the glass for me./*Sam broke me the glass.

(28) CREATION-DIRECTED ACTIVITY VERBS: **carve**, crochet, embroider, knit, sculpt, sew, spin, weave, whittle, ...

a. Unspecified object alternation:
Sam carved the doll./Sam carves in the evenings.

b. Benefactive alternation:
Sam carved a doll for me./Sam carved me a doll.

c. Causative alternation:
Sam carved a doll./*The doll carved.

• Towards a solution: Two senses of *bake*

(29) a. CHANGE OF STATE *bake*: to change the state of something by dry heat in an oven: *Sam baked the potatoes for an hour at 375F.*

b. CREATION *bake*: to create by means of changing the state of something by dry heat in an oven: *Sam baked a birthday cake for Chris.*

	break	*carve*	*bake* (change)	*bake* (activity)
Causative alternation:	yes	no	yes	no
Unspecified object alternation:	no	yes	no	yes
Benefactive alternation:	no	yes	no	yes

The problematic constellations of properties arises from a failure to recognize that a verb may show multiple senses and, hence, have multiple class membership.

• Due to such observations, Levin posits multiple class membership for 784 of 3024 verbs (26%), according to Lapata & Brew (2004).

• What determines whether a given verb will show properties of more than one verb class?

• Wheeler (1996) argues verbs with multiple class membership belong "basically" to one class.

She exemplifies this point with *search* verbs, but it applies more generally:
— most likely, cooking verbs are basically creation-directed activity verbs;
— moreover, the intuition that *throw* verbs are not core dative verbs may reflect a basic membership outside the *give* verb class (RH&L 2008).

4.3 Summary

Although verb classes are a useful device for studying the semantic organization of the verb lexicon, it is necessary to look beyond them to understand the nature of verb meaning.

Part II: Role-Centered Approaches to Lexical Semantic Representation

5 A semantic role approach to *hit* and *break*

To explain the differences between the two verbs and the verb classes they represent, Fillmore proposes that the semantic relations that their arguments bear are not the same.

• The direct objects of verbs of the two types are associated with distinct semantic roles: 'Object' for *break* verbs (more commonly, 'patient') and 'Place' for *hit* verbs (more commonly, 'location').

The label 'Place' is intended to capture the insight that *hit* verbs need not cause a change of state.

(30) The rocks hit the windshield, but luckily it wasn't damaged.

• Each verb type is characterized by the number of participants associated with its members, as well as by their semantic roles. (Fillmore also includes information concerning the optional or obligatory status of each role.)

(31) a. *break*: Agent, Instrument, Object
b. *hit*: Agent, Instrument, Place

• The similarities between *hit* verbs and *break* verbs follow because verbs of both types select arguments bearing the roles Agent and Instrument.

• The behavioral differences between verbs of the two types follow from the presence of 'Object' on one verb's semantic role list vs. the presence of 'Place' on the other's.

• A SHORTCOMING: Why should 'Objects/patients' and 'Places/locations' differ in these ways?

6 Basics of a semantic role-centered approach

THE BASIC ASSUMPTION: The meaning of a verb can be represented by—and, thus, **reduced to**—a list of semantic role labels, each identifying the semantic relation an argument bears to it.

A REPRESENTATIVE SET OF SEMANTIC ROLES:

(32) a. Agent (A), the instigator of the event
b. Counter-Agent (C), the force or resistance against which the action is carried out
c. Object (O), the entity that moves or changes or whose position or existence is in consideration
d. Result (R), the entity that comes into existence as a result of the action
e. Instrument (I), the stimulus or immediate physical cause of an event
f. Source (S), the place from which something moves
g. Goal (G), the place to which something moves
h. Experiencer (E), the entity which receives or accepts or experiences or undergoes the effect of an action . . .

(Fillmore 1971: 376)

6.1 Why people like role-centered approaches

ADVANTAGES OF SEMANTIC ROLE LISTS:
— Capture relationships between sentences that are obscured by syntax
— Provide a basis for perspicuous statements of argument realization

(33) '... case structure descriptions of words and sentences offered a level of linguistic organization at which universal properties of lexical structure and clause organization are to be found, and, moreover, ... such descriptions were in some sense intuitively relatable to the ways people thought about the experiences and the events that they were able to express in the sentences of their language.' (Fillmore 1977: 62)

(34) 'At the entry level at least *anybody* can do it [=case grammar], in the privacy of their own home, with no linguistic training required! ...
The reason that anyone can do this kind of case grammar is that football fans for example are very knowledgeable about Goals, aficionados of "General Hospital' or "St. Elsewhere" know all about Patients, and anyone who has watched a James Bond movie can identify an Agent.' (Starosta 1990: 86)

6.2 Implementing a role-centered approach: The crucial issues

• CRUCIAL QUESTIONS:
— How do you choose a set of semantic roles?
— How do you assign semantic roles to the NPs in a sentence?

• CHOOSING A SET OF SEMANTIC ROLES:
— Need to cover types of semantic relationships nouns bear to verbs.
— Choose roles that capture natural classes of arguments to bring out similarities and differences in verb meaning reflected in argument expression.
— Set shouldn't be so big that it is impossible to capture generalizations, nor so small that it doesn't allow for distinctions (the lumping/splitting dilemma).

• FUNDAMENTAL ASSUMPTIONS FOUND IN MOST SEMANTIC ROLE LIST APPROACHES:

(35) a. the semantic roles are taken to be semantically unanalyzable,
b. the semantic roles are defined independently of the meaning of the verb,
c. the set of semantic roles is small in size.
(Croft 1991:156)

CHARACTERISTICS OF THEORIES OF SEMANTIC ROLES:

(36) a. INDEPENDENCE: Each semantic role is given a consistent semantic definition that applies to all verbs and all situations, e.g., role definitions do not depend on the identity of a particular verb or on other roles it assigns.
b. COMPLETENESS: Every argument of every verb is assigned some semantic role.
c. UNIQUENESS: Every argument of every verb is assigned only one semantic role.

d. DISTINCTNESS: Every argument of every verb is distinguished from the other arguments of the same verb by the role(s) it is assigned.
STRONG (BIUNIQUE): when uniqueness also holds
WEAK: Uniqueness doesn't hold, i.e., each argument is assigned a different set of roles from other arguments of same verb

(David Dowty, class notes, LSA Institute, 6/1993)

THE EFFECT OF UNIQUENESSS: Precludes labelling *Sam* both a benefactive and a goal:

(37) I bought **Sam** a car.

THE EFFECT OF DISTINCTNESS:

— Acknowledges the oddness of 'One-per-sent' violations (Starosta 1978):

(38) $*$ Pat sent the book to Tracy to Sandy.

— Precludes labelling both *crane* and *hay* as instruments:

(39) The farmer loaded the truck with hay with a crane.

(40) a. The farmer used the crane to load the truck with hay.
b. # The farmer used the hay to load the truck.

• MORE GENERAL REQUIREMENTS ON A SET OF PRIMITIVE PREDICATES (Wilks 1987):
(Though these criteria can be adapted to semantic roles)

(41) a. FINITUDE: set of primitives should be smaller than set of words whose meaning it encodes
b. COMPREHENSIVENESS: set should be adequate to express and distinguish the senses of the word meanings it is to encode
c. INDEPENDENCE: no primitive should be definable in terms of other primitives
d. NONCIRCULARITY: no two primitives should be mutually definable
e. PRIMITIVENESS: no subset of primitives should be such that it could be plausibly replaced by a smaller defining set

• ON THE DIFFICULTIES OF FINDING PRIMITIVES:

(42) 'Hunting for semantic and lexical universals is not like pearl-fishing. Primitives do not present themselves glittering and unmistakable. Identifying them is an empirical endeavour but one that calls for much interpretative effort.' (Wierzbicka 1994: 445)

7 Semantic roles lose their shine

• Semantic roles did not live up to their promise, as manifested in:

— Lack of consensus on number and set of roles.

— Lack of reliable diagnostics for isolating semantic roles.
  – Diagnostics identify something else (e.g., syntactic, pragmatic notions).
  – Grammatical markers are often inadequate (e.g., *with*).

(43) a. Instrument: *slice with a knife*
  b. Comitative: *work with Kim*
  c. Theme: *spray a chair with white paint*
  d. Cause: *shiver with cold*
  e. Manner: *laugh with glee*

— Disagreements about role assignments to particular NPs.

(44) a. Instrument or theme: *I sprayed the wall with* **paint**.
  b. Benefactive or goal: *I bought* **Sam** *a car.*

— Recourse to "wastebasket" patient or theme role or to one-off roles.

(45) a. The engineer avoided the bridge.
  b. The engineer studied the bridge.
  c. The engineer confirmed the start date.

• Problems with semantic roles:

— Different phenomena require different grain-size roles.

(46) a. Pat came to the library/from the cafeteria/through the woods.
  b. Pat came from the cafeteria to the library.

— Problem of near-paraphrases: capturing similarities and differences.

An assignment that captures the near-paraphrase relation:

(47) a. Terry loaded the truck (location) with hay (theme).
  b. Terry loaded the hay (theme) on the truck (location).

But it fails to capture the perception that it is the object in each sentence that is "affected".

— Inability to capture crossclassification: e.g., case syncretisms.

— Problems of overall explanatory effectiveness:
  – No insight into argument realization generalizations.
  – Why are verbs at most triadic (Carter 1976)?
  – Why do only some sets of semantic roles cooccur?

(48) a. 'Agent, Patient, Instrument': e.g., *break*, *cut*, *mix*
  b. 'Theme, Source, Goal': e.g., *run*, *swim*, *walk*
  c. 'Location, Experiencer, Patient': No verbs?

ONE SOLUTION: Semantic roles are labels for recurring sets of entailments of arguments that enter into generalizations (Dowty 1989, 1991).

THE BOTTOM LINE: A small universal set of semantic roles does not provide an articulated enough lexical semantic representation.

Semantic role representations reduce a verb's meaning to a set of roles assigned to its arguments.
The set of semantic roles is taken to be independent of the verbs, and there is no organizational framework for determining or constraining what the overall set of roles should be, nor what set is appropriate for a given verb.

8 Event conceptualization and lexical semantic representation

Two dimensions of variation in lexical semantic representations:
— the nature of the representation, e.g., semantic roles, predicate decompositions
— the model of event conceptualization, i.e., the organizing hypothesis

Why is a model of event conceptualization important?
  Such a model embodies a hypothesis about the way in which events are organized in language.

The most successful theories of lexical semantic representation are organized around such a hypothesis, which helps to choose among various meaning components and semantic representations.

TWO COMPETING PROPOSALS FOR THE MODEL OF EVENT CONCEPTUALIZATION:
— in terms of the causal structure of the event: a causal approach
— in terms of the time course of an event: an aspectual approach

Certain meaning components said to be relevant to semantic representations recur in various studies:
— Causation: CAUSE
— Change: BECOME, CHANGE, GO, T (transition)
— State: BE
— Measuring out (Tenny 1987, 1992, 1994), Incremental theme (Dowty 1991)
— Telicity: endpoint/goal/terminus/telos
— Affectedness: Patient role, AFF
— Agency: Agent role, ACT, DO
— Process/activity: ACT, DO, P (process)
(The list is inspired by the work of Carter, Croft, Dowty, Fillmore, Jackendoff, McCawley, Pustejovsky, Tenny, Van Valin, Wierzbicka, Wunderlich, among others.)

The items listed reflect a debate as to whether an aspectual, a causal, or a hybrid model of event conceptualization is preferable.

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