

# Aspect, Roles, and Lexical Semantics

Jean Mark Gawron

March 20, 2007

## 1 Roles

Is there some finite inventory of **roles** that participants in events described by single clauses play?

- (1) Gina raised the car with a jack.  
X Predicate Y Z

The **initiator** of some action, capable of acting with volition

- (2) *Agent*
- (a) **David** cooked the bacon.
  - (b) **The fox** jumped out of the ditch.
  - (c) **The magnet** attracted the metal filings. (energy sink)

The entity undergoing some action, often undergoing some **change of state** (breaking, melting, boiling, evaporating, fainting):

- (3) *Patient*
- (a) Enda cut back **these bushes**.
  - (b) The sun melted **the ice**.

The entity which is **moved** by some action, or whose location is described (but constitutionally unchanged)

- (4) *Theme*
- (a) Enda cut back **these bushes**.
  - (b) The sun melted **the ice**.

(5) *Theme vs. Patient*

- (a) Theme: Fred threw the **the rock** (movement).
- (b) Patient: Fred shattered **the rock** (change of state).

The entity which is **aware** of the action, or state described by the predicate, but which is not (necessarily) in control of the action or state

(6) *Experiencer*

- (a) **Kevin** felt ill.
- (b) **Mary** saw the smoke.

The entity for whose **benefit** the action was performed

(7) *Beneficiary*

- (a) Robert filled in the form for **his grandmother**.
- (b) The baked **me** a cake.

The means by which an action is performed or something comes about

(8) *Instrument*

- (a) She cleaned the wound with **an antiseptic wipe**.
- (b) They signed the treaty with **the same pen**.

The place in which something is situated or takes place

(9) *Location*

- (a) The monster was hiding **under the bed**.
- (b) The band played **in a marquee**.

The entity toward which something moves, either literally as in (10a) or metaphorically as in (10b):

(10) *Goal*

- (a) She handed her license to **the policeman**.
- (b) Paul told the joke to **his friends**.

The entity from which something moves, , either literally as in (11a) or metaphorically as in (11b):

(11) *Source*

- (a) The plne came back from **Kinshasa**.
- (b) We got the idea from **a French magazine**.

- (12) Gina raised the car with a jack.  
Agent Predicate Theme Instrument

The list (thus far):

1. Agent
2. Patient
3. Theme
4. Experiencer
5. Beneficiary
6. Instrument
7. Location
8. Goal
9. Source

Is this list complete?

- (13) *The open-endedness of thematic roles*

- (a) Additional: He gave him a sum of money *besides the cattle*.
- (b) Substitutive: She bought a cow *instead of a Volvo*.  
She replaced the cow *with a Volvo*
- (c) Similar: He danced *like a hummingbird*.
- (d) Outnumbered: The Greeks outnumber *the Cypriots*.
- (e) Fundstye: He bought it *on credit*.

The response to this objection

- (14) Our theory of thematic roles focuses primarily on those which can Subject and Object.

An alternative approach

- (15) *Θ-roles*
- (a) (Possibly) unique to each verb [no theoretical commitment]
  - (b) Crucial feature: The distinct arguments of a verb bear distinct theta roles.
  - (c) *theta*-roles are obligatory
  - (d) The *θ*-criterion: Each *θ*-role is assigned to exactly one NP and each NP receives exactly one *θ*-role.

A major theoretical enterprise:

- (16) *Linking Theory*
- (a) Typically accompanied by a genuine theory of thematic relations
  - (b) Stipulates which roles become subject, which become direct object
  - (c) Subject > Object > Obj2
  - (d) Agent > Theme > Goal

## 2 Argument Alternations: Challenge for linking theories

Location/material: Theme/Goal

- (17)
- a. Water filled the pool. (state reading also)
  - b. The pool filled with water. (no state reading)
  - c. The pool was full of water.
  - d. \* The water was full with pool.

Instrument subjects:

- (18)
- a. The door opened with a brass key.
  - b. The brass key opened the door.
  - c. John opened the door with a brass key.
  - d. \* The key opened the door by John.

Many of the following alternations were studied in Partee (1965)

- (19) *Spray-load alternation*
- (a) John load the wagon with hay.

- (b) John loaded hay onto the wagon.
  - (c) Susan sprinkled glitter onto the snow.
  - (d) Susan sprinkled the snow with glitter.
  - (e) The garden was swarming with bees.
  - (f) Bees swarmed in the garden.
  - (g) Water filled the pool.
  - (h) The pool filled with water.
- (20) *Source-Theme alternation*
- (a) John drained the skull of blood.
  - (b) John drained the blood from the skull.
  - (c) Susan cleared the table of dishes.
  - (d) Susan cleared the dishes from the table.
- (21) *Supply-alternation*
- (a) Frieda supplied vodka to the Finns.
  - (b) Frieda supplied the Finns with vodka.
  - (c) Alan served the pie to the guests.
  - (d) Alan served the guests with pie.
- (22) *Dative-alternation*
- (a) John gave the book to Mary.
  - (b) John gave Mary the book.
  - (c) The doctor gave Frankenstein a green skin.
  - (d) ? The doctor gave a green skin to Frankenstein.
  - (e) That guy gives me the creeps.
  - (f) That guy gives the creeps to me.
- (23) *Substitution*
- (a) She replaced the cow with a Volvo.
  - (b) She substituted the Volvo for the cow.
- (24) *Issues for linking theory*
- (a) Argument alternations (diathesis alternations) typically pose a challenge for a linking theory.
  - (b) They represent places where (at least apparently) the grammar is equivocal about what becomes subject/direct object.

- (25) *General Issues*
- (a) A key role for thematic relations is in providing a foundation for the linking theory.
  - (b) Language after language agents become subjects
  - (c) Ergative languages appear to adopt a distinct linking pattern for transitives: Agents are direct objects
  - (d) But even in ergative languages there are consistent facts about how agents are marked.
  - (e) The concept agent is important
- (26) *Interaction with Subjecthood/ Voice*
- (a) John spread butter on the bread.
  - (b) John spread the bread with butter. [holistic: “covered” reading, (Anderson 1971)]
  - (c) The bread was spread with butter. [Holistic reading]
  - (d) Bees swarmed in the garden.
  - (e) The garden swarmed with bees. [entire garden aswarm]
  - (f) Fred climbed up the mountain.
  - (g) Fred climbed the mountain. [got to top].

### 3 Agent is not a primitive

- (27) *Kill is 'Cause to die'*
- (a) Ethel killed Fred.
  - (b)  $\exists e[\text{kill}(e) \wedge \text{agent}(e, \text{ethel}) \wedge \text{theme}(e, \text{Fred})]$   
DO(ethel) CAUSE [BECOME [NOT ALIVE(Fred)]]
  - (c) Important difference between semantic primitive CAUSE and the verb *cause*: Direct causation only for CAUSE
    1. Jebediah caused the pot to be broken. [e.g., he ordered Sue to do it.]
    2. Jebediah broke the pot. [he had to be directly involved.]
- (28) *Motivations*
- (a) Correlations between aspectual properties of last chapter and agentivity
  - (b) Accounting for the semantic complexity of agent-clauses, especially with regard to adverb interpretation.

- (c) Metatheoretical considerations we struggle with later.

## 4 Problems and Dowty's Theory

“Affectedness” (change of state) spread over a broad semantic area (Dixon)

1. touch
2. rub
3. squeeze (temporary change of shape)
4. smash (loss of physical integrity)

Dowty (1991) tries to decompose thematic relations in to entailments.

Entailments shared by  $x$  in  $x$  *nominates*  $y$ .  $x$  *murders*  $y$ , and  $x$  *interrogates*  $y$ :

- (29) *nominate, murder, interrogate*
- (a)  $x$  does a volitional act
  - (b)  $x$  intends this to be the kind of act named by the verb
  - (c)  $x$  causes some event to take place involving  $y$  ( $y$  dies,  $y$  acquires a nomination,  $y$  answers questions)
  - (d)  $x$  moves or changes externally (not just mentally)
- (30) *Proto-Agent Entailments*
- (a)  $x$  does a volitional act
  - (b)  $x$  is sentient
  - (c)  $x$  causes some event to take place involving  $y$
  - (d)  $x$  moves or changes externally (not just mentally)

Incremental theme (as more of  $y$  is affected the event comes closer and closer to completion)

- (31) a. John mowed **the lawn**.  
b. John ate **the sandwich**.  
c. John repaired the computer. [No!]

- (32) *Proto-Patient Entailments*

- (a) y undergoes change of state
- (b) incremental theme
- (c) Causally affected by another participant
- (d) stationary relative to a moving participant.

The rule: The participant with the most proto agent entailments becomes Agent. The participant with the most proto-patient entailments becomes Patient

Dowty has a subject-selection hierarchy (like others, especially Fillmore (1968)) but does not assume the roles are **primitives**.

$$\text{Agent} > \left\{ \begin{array}{l} \text{Instrument} \\ \text{Experiencer} \end{array} \right\} > \text{Patient} > \left\{ \begin{array}{l} \text{Source} \\ \text{Goal} \end{array} \right\}$$

- (33) a. Captain Nemo sank the ship with a torpedo.
- b. The torpedo sank the ship.
- c. The ship sank.

## 5 'Agentivity' Tests and Aspect

Agent is a special case of **Actor** (Foley and van Valin 1984, Jackendoff 1990) (actor perform, effect, instigate or controls).

- (34) **The car** ran over the hedgehog. (actor but not agent, no purpose or wish)
- (35) *Agentivity Tests*
  - (a) John took the book from Bill in order to read it (in order to)
  - (b) ? John deliberately took the book from Bill.
  - (c) ? John received the book from Bill in order to read it.

- There is a series of tests that link agentivity (actorhood) and aspect.

The assumption of this battery of tests is that achievements and states (as opposed to accomplishments and activities) are incompatible with having agents. This is an interesting idea. Why should this be the case?



1. *Persuade* test

(36) *Persuade only with +Action*

- (a) Jubal persuaded Mary to draw a circle.
- (b) Jubal persuaded Mary to walk in the park.
- (c) # Jubal persuaded Mary to know the answer.
- (d) # Jubal persuaded Mary to notice the spot on his jacket.

2. *Try* test

(37) *Try only with +Action*

- (a) Mary tried to draw a circle.
- (b) Mary tried to walk in the park.
- (c) # Mary tried to know the answer.
- (d) # Mary tried to notice the spot on Harry's jacket.

3. Volitional manner adverbs: *deliberately, carefully, conscientiously*

(38) *Volitional adverbs only with +Action*

- (a) Mary carefully drew a circle.
- (b) Mary deliberately walked in the park.
- (c) # Mary carefully knew the answer.
- (d) # Mary deliberately notices the spot on his jacket.

4. Imperatives

(39) *Imperatives only with +Action*

- (a) Draw a circle!
- (b) Walk in the park!
- (c) # Know the answer.
- (d) # Notice the spot on my jacket!

5. *What x did*

(40) *what x did only with +Action*

- (a) What John did was draw a circle!
- (b) What John did was walk in the park!
- (c) # What John did was know the answer.
- (d) ? What John did was notice the spot on my jacket!

• Finish, Almost, Again: Internal Structure

(41) *Finish only with accomplishments*

- (a) Jebediah finished writing the book.
- (b) # Jebediah finished noticing the spots on Jack's sweater.
- (c) # Jebediah finished knowing the answer.
- (d) ? Jebediah finished walking in the park (around 3).[better with *stop*]

(42) *Ambiguities with almost*

- (a) Jubal was almost rich.
  1. It almost came about that Jubal was rich.[His lottery ticket was only one number more than the winning number]

Almost ( $\exists\sigma[\text{rich}(\sigma) \wedge \text{theme}(\sigma, \text{Jubal})]$ )

2. The state Jubal was actually in was one you could almost call rich.[Jubal cashed out his stock options and made \$999,992.]

$\exists\sigma[\text{Almost}(\text{rich}(\sigma)) \wedge \text{theme}(\sigma, \text{Jubal})]$

- (b) Jubal almost swam.
  1. It almost came about that Jubal swam.[He dipped his toe in the pool.]

Almost ( $\exists e[\text{swim}(e) \wedge \text{agent}(e, \text{Jubal})]$ )

2. What came about was event in which Jubal was the agent and you could almost call it swimming.[He got in the pool and made genuinely swimmer like motions before sinking like a stone.]

$\exists e[\text{Almost}(\text{swimming}(e)) \wedge \text{agent}(e, \text{Jubal})]$

- (c) Jubal almost noticed the spots. (distinct readings harder to identify)

1. It almost came about that Jubal noticed the spots.
2. What came about was an event in which Jubal was the experiencer and you could almost call it noticing.

- (d) Jubal almost ran a mile.

1. It almost came about that Jubal ran a mile.[He put on his jogging shorts.]

Almost ( $\exists e[\text{run}(e) \wedge \text{agent}(e, \text{Jubal}) \wedge \text{distance}(e, [\text{mile } 1])]$ )

2. What came about was an event in which Jubal was the agent and the distance was a mile and you could almost call it running. [He jostled along for a mile.]

$\exists e[\text{Almost}(\text{running}(e)) \wedge \text{agent}(e, \text{Jubal}) \wedge \text{distance}(e, [\text{mile } 1])]$

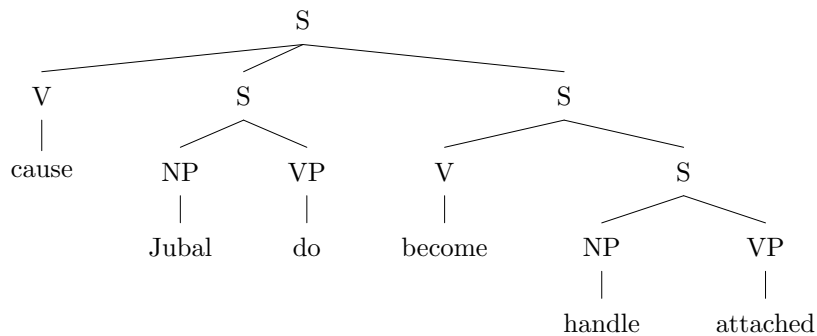
3. What came about was a running event in which Jubal was the agent and the distance was almost a mile. [He ran three-quarters of a mile.]

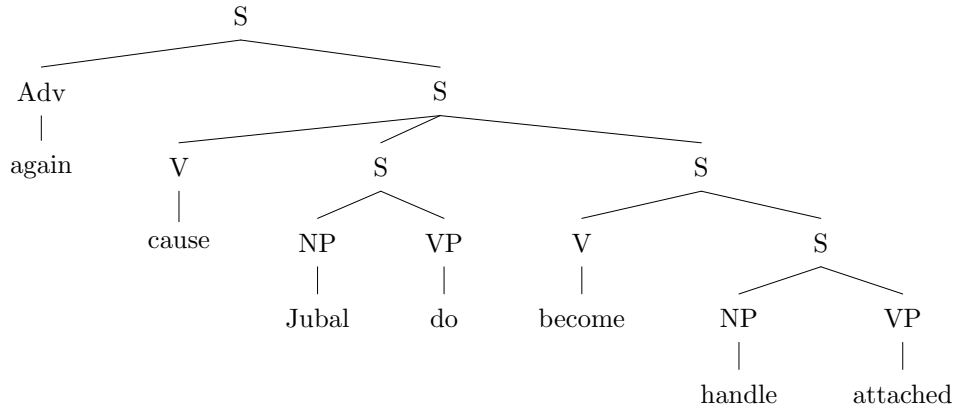
$\exists e[\text{running}(e) \wedge \text{agent}(e, \text{Jubal}) \wedge \text{Almost}(\text{distance}(e, [\text{mile } 1]))]$

(43) *Again ambiguities*

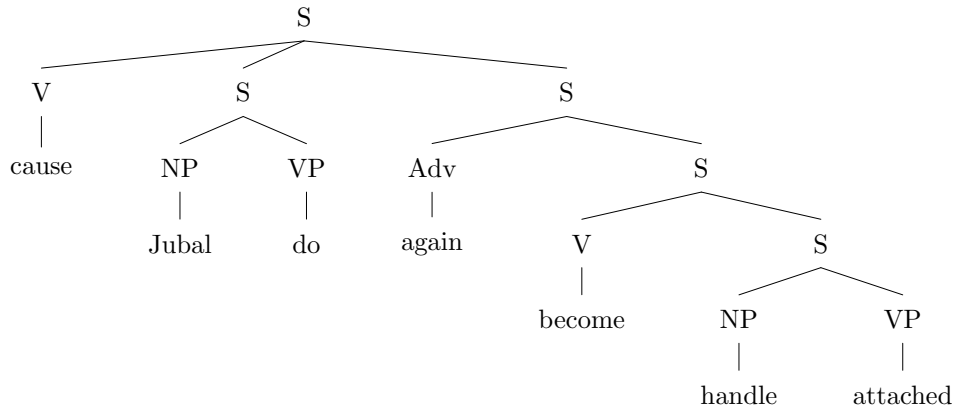
- (a) John noticed the spot again.  
 (b) John was rich again.  
 (c) John attached the handle again. (on the iron)
1. He had done it before.
  2. It had been detached and re-attached before, but not by John.
  3. It had become detached. He put it back on, but it had never been re-attached before. [restitutive reading]

Moral: Accomplishments are semantically the most complex:

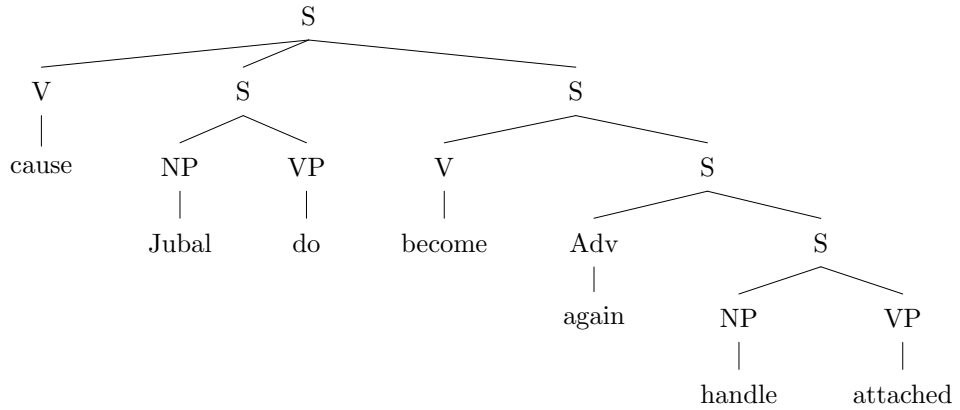




Reading 1: He had done it before.



Reading 2: It had been detached and re-attached before, but not by John.

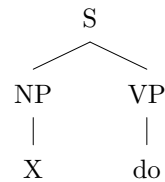


Reading 3: It had never been reattached before. He just restored it to its whole state. [restitutive reading]

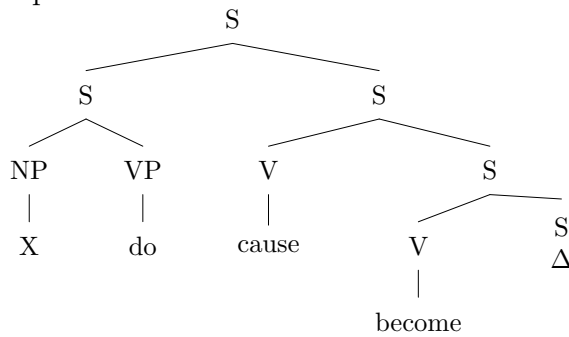
- What is agentivity? (Lakoff 1972, Dowty 1979)

(44) *One answer*

- (a) X is an agent iff ...
- (b) X's does something
  1. the predicate DO in the semantics
  2. Two cases
    - i. No result: Activity



- ii. X's doing something causes something to come about: Accomplishment

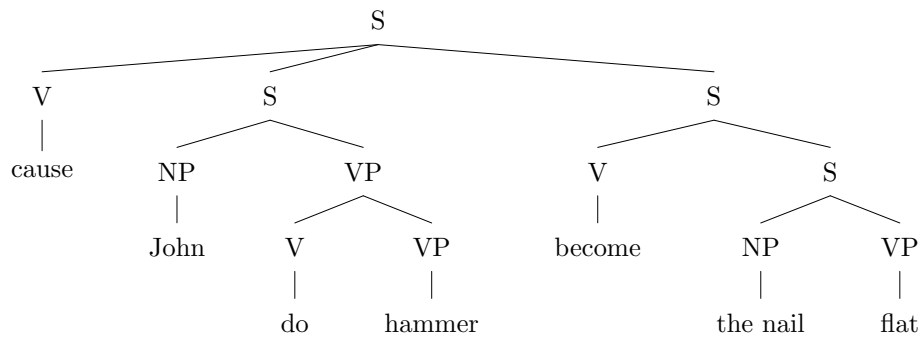


- (c) Explains
  1. Why achievements and states fail all agentivity tests: They lack the predicate DO
  2. Ambiguities of *almost* and *again* with accomplishments (“internal complexity”, Section 9.2.4): there is more semantic complexity and thus more parts of semantic structure for adverbials modifiers to modify.

*Do the complex semantic structures associated with accomplishments always get lexicalized?*

- (45) *Sometimes expressed as constructions*
  - (a) John hammered the nail flat.
  - (b) John burnt the beans black.
  - (c) John sneezed the flour off the table.
  - (d) John wiped the table clean.
  - (e) The lake froze solid.
  - (f) ? The lake thawed liquid.

Resultatives have the structure of an accomplishment



- (46) Lexicalization of accomplishments
  - (a) In principle, an accomplishment has a DO component and a result component (2nd argument of CAUSE); and the related activity has just the DO component:
 
$$draw_{tr} = CAUSE(DO(DRAW), BECOME(EXISTS))$$

$$draw_{itr} = DO(DRAW)$$
  - (b) John drew (the circle).
    - (a) DO: draw

- (b) RESULT: The circle exists
- (c) John traced the circle (in 60 seconds/for 60 seconds).
  - (a) DO: trace (cf. John drew.)
  - (b) RESULT: The circle is traced?/ is circumnavigated by a tracing instrument?
- (d) John beat the eggs (in 3 minutes/for 3 minutes)
  - (a) DO: beat
  - (b) RESULT (stuff/recipe dependent): smooth or stiff or creamy (slightly thickened)
- (e) John washed his hair.
  - (a) DO: wash
  - (b) RESULT: clean
- (f) John mowed the lawn.
  - (a) DO: mow
  - (b) RESULT: short? shorn? mowed?

*Is causality linked to agentivity?*

- (47) *Not always; with resultatives, maybe*
  - (a) The storm broke the windows.[Causers need to include non-agentive causers, sometimes called “Forces”]
  - (b) CAUSE(the storm, [BECOME[BROKEN(the windows)]])
  - (c) John hit the ball.
  - (d) The bat hit the ball.
  - (e) John hit the ball over the fence.
  - (f) ? The bat hit the ball over the fence.
  - (g) Conclusion: The resultative construction requires a “DO” in its semantics.
- (48) *Is agentivity linked to aspect?*
  - (a) A white linen tablecloth covered the table.[stative reading]
  - (b) John covered the table with a white linen table cloth. [no stative reading]

## 6 Themes

- (49) *The same questions as with agents*

- (a) What is a theme?
- (b) Is there an aspectual generalization? [Historical fact: the term theme gets used in all 4 Vendlerian classes]
- (c) Ideas/properties
  - (1) Done to rather than doing to (NOT the agent)
  - (2) Changes state [freezes, breaks..]
  - (3) Moves
  - (4) Comes into/goes out of existence
  - (5) gets progressively processed [Incremental theme: aspectual notion]

*A clear (aspectually defined) subclass*

- (50) *Incremental themes*
- (a)  $x \text{ Ved } y \text{ in } e \rightarrow \exists e' \text{ a temporal subpart of } e: x \text{ Ved } a \text{ subpart of } y \text{ in } e'$
  - (b) John mowed the lawn. [progressive effect]
  - (c) John ate the sandwich. [progressive destruction]
  - (d) John drew the circle. [progressive creation]
  - (e) John read the poem. [progressive information processing or performance (read it aloud)]

*Therefore boundedness of these themes should affect boundedness (telicity) of clause*

- (51)
- a. # John mowed lawns in 30 minutes.
  - b. # John ate sandwiches in 30 minutes.
  - c. # John drew circles in 2 hours.
  - d. # John read poems in 5 hours.

*What's not clear is that this clear subclass identifies a linguistically significant idea*

- (52) *NonIncremental themes in accomplishments too*
- (a)  $x \text{ Ved } y \text{ in } e \not\rightarrow \exists e' \text{ a temporal subpart of } e: x \text{ Ved } a \text{ subpart of } y \text{ in } e'$
  - (b) John melted the butter. (holistic theme)
  - (c) John burned the wood.
  - (d) John dried the towel.



*But nonincremental themes also affect the boundedness (telicity) of the clause*

- (53) a. # John melted butter in 30 minutes.  
b. # John burned wood in 15 minutes.  
c. # John dried towels 2 hours.
- (54) *Conclusion*
- (a) The notion theme is too vague to be of much use for aspectual classification.
- (b) It is difficult to say whether it means much more than non-agent in terms of a linking theory.
- (c) The notion incremental theme is clear but appears to be too specific to capture any significant generalization. In particular it does not predict which participants affect clause boundedness.

## 7 Summarizing: Verb Classes

- (55) *Inchoative(verbs of becoming)*

BECOME[STATE(y)]

- (a) The lake froze.

BECOME[FROZEN(the lake)]

- (b) The water cooled.

BECOME[COOL(the water)]

- (c) The metal liquefied/melted.

BECOME[LIQUID(the metal)]

Note: There may be something more going on here. Melting must be the result of heat. Liquefaction can be caused by pressure. Means by which becoming happens part of lexical semantics...

- (d) X condensed vs. X melted

BECOME[LIQUID(X)]

Note: There may be something more going on here too.

condensation: vapor → liquid  
melt: solid → liquid

Previous state before becoming part of lexical semantics.

(56) *Agentive(agentive activities)* DO(x)

(a) Jebediah laughed.

DO LAUGH(Jeb)

(57) *Agentive causative (agentive accomplishments)*

DO(x)

(a) Jebediah broke the vase.

[DO(j, SOMETHING)] CAUSE [BECOME[BROKEN(the vase)]]

(58) *Agentive causative (agentive accomplishments)*

DO(x)

(a) The storm broke the windows.

(the storm) CAUSE [BECOME[BROKEN(the vase)]]

(59) *States (the simplest)*

STATE(x)

(a) Jebediah knows the answer

KNOW(j, the answer)

(b) The soup is cool.

COOL(the soup)

## 8 A larger program

(60) *Lakoff (1972)*

“In the analyses offered above, certain predicates keep recurring: CAUSE, COME ABOUT, SAY, GOOD, BAD, BELIEVE, INTEND, RESPONSIBLE FOR, etc. These are all sentential operators ... It seems clear that we would want these, or predicates like these, to function as atomic predicates in natural logic. Since these keep recurring in our analyses, it is quite possible that under the lexical decomposition hypothesis the list would end somewhere... verbs like *kick* and *scrub* could be ruled out as sentential operators since they could be analyzed in terms of already existing operators, as in [Sam caused the door to come to be open by kicking it] or [Sam caused the floor to come to be clean by scrubbing it]. This seems to me to be an important claim. Kicking and scrubbing are two out of a potentially infinite number of human activities. *Since the number of potential human activities and states is unlimited, natural logic will have to provide an open-ended number of atomic predicates corresponding to these states and activities. Hopefully, this can be limited to atomic predicates that do not take sentential complements.*”

## References

- Anderson, Steven R. 1971. On the role of deep subjects in semantic interpretation. *Foundations of Language* 7:361–377.
- Dowty, David. 1979. *Word Meaning and Montague Grammar*. Boston: Reidel.
- Dowty, David R. 1991. Thematic proto roles and argument selection. *Language* 67:547–619.
- Fillmore, Charles J. 1968. The case for case. In E. Bach and R. T. Harms (Eds.), *Universals in Linguistic Theory*, 1–210. New York: Holt, Rinehart and Winston.
- Lakoff, George. 1972. Linguistics and natural logic. In D. Davidson and G. Harman (Eds.), *Semantics of Natural Language*, 545–665. Dordrecht: Reidel.

Partee, Barbara. 1965. *Subject and Object in Modern English*. PhD thesis, MIT.