Lexical Representations

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Semantics

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Overview

Outline

Lexical semantics

1. Relatedness of predicates with different parts of speech

verbs/adjectives

a. the soup is cool.
b. the soup cooled.

2. Preposition choice: John had a glass. He ...
   1. ... gave it to/?with/?from Mary.
   2. ... received it ?to/?with/from Mary.
   3. ... broke it ?to/with/from a hammer.
   4. ... broke it against a hammer.

Semantic generalizations behind valence (syntactic frames)

verb classes

John
- a. loaded the truck with hay.
- b. sprayed the wall with paint.
- c. smeared the trap with honey.

John
- a. loaded hay onto the truck.
- b. sprayed paint onto the wall.
- c. smeared honey onto the trap.

Linking theory: predicting subj and obj

Animate Subject factors [strong Agentivity]

1. A has volition. (A murdered P)
2. A has control over involvement in an event or state. (A caught P)
3. A is willful initiator of event or state (A grasped P)
4. A has consciousness, sentience, perception. (A saw P)

Other Subject factors [weak Agentivity]

5. A is initiator, instigator, or causer of event (A dried P)
6. A is source of force directed at another entity. (A attracted P)
7. A moves, coming into contact with a stationary entity. (A hit P)
8. A moves or is located relative to an entity which is stationary (figure/ground) (F hovered over G)

Outline

do (be do be do)

The primitive do exists primarily to distinguish primitive processes from primitive states.

process v. state

state	the branch is strong	$\textsc{strong}(\mathrm{b})$
process	the branch fell	$\mathrm{do}(\mathrm{b}, [\textsc{fall}(\mathrm{b})])$
	the branch swayed	$\mathrm{do}(\mathrm{b}, [\textsc{sway}(\mathrm{b})])$
	the flag fluttered	

DO

1. Volition/ intension of x to do y
2. John jumped.
3. $\textsc{do}(\textsc{j}, [\textsc{do}(\textsc{j}, [\textsc{jump}(\textsc{j})])])$
4. John fell.
5. $\textsc{do}(\textsc{j}, [\textsc{fall}(\textsc{j})])$
6. John is smart.
7. $\textsc{smart}(\textsc{j})$

Outline

BECOME

Inchoatives

(a) The glass broke.
(b) BECOME [BROKEN(G)]
(c) The glass cooled.
(d) BECOME [COOL(G)]
(e) The glass melted.
(f) BECOME [MELTED(G)]

Inchoatives: Adj → Verb

Inchoatives

(a) The glass broke.	(a') The glass was broken.
(b) BECOME [BROKEN(G)]	(b') BROKEN(G)
(c) The glass cooled.	(b') The glass was cool.
(d) BECOME [COOL(G)]	(d') COOL(G)
(e) The sky darkened.	(e') The sky was dark.
(f) BECOME [DARK(S)]	(f)' DARK(S)
(g) The nose cone slowly heated.	(g') The nose cone was hot.
(h) BECOME [HOT(NC)]	(h') HOT(NC)

Causative verbs

CAUSE + Inchoative

(a) John broke the glass. (intentionally)

(b) DO(J, [do(J) CAUSE [BECOME [BROKEN(G)]])

(c) The breeze cooled the glass. (breeze nonvolitional participant in causing event)

(d) do(B) CAUSE BECOME [COOL(G)]

(d') B CAUSE BECOME [COOL(G)]
text allows this, distinction not important

(e) The fall broke the glass.

(f) F CAUSE BECOME [BROKEN(G)]

put/give/kill as causatives

put type

a. x put y on z

b. x CAUSE [BE-AT(y, ON(z))]

c. x gave y to z

d. x CAUSE [POSS(y, z)]

d'. x CAUSE [BE-AT$_{\text{POSS}}$(y, z)]

e. x kill y (= x *deadened y)

f. x CAUSE [BECOME(DEAD(y))]

Summary

Dowty analysis

State	STATE(X)	COOL(S)
Process	do(x, [PROCESS(x)])	do(f, [FLUTTER(x)])
Achievement	BECOME [STATE(X)]	BECOME [COOL(S)]
Accomplishment	X CAUSE [BECOME [STATE(X)]]	J CAUSE [BECOME [COOL(S)]]

Outline

Definition of location pred

A location predicate locates one object in space (the FIGURE) with respect to another (the GROUND). Simple clauses with location predicates are **states**. The grounds are typically realized in Locative PPs. *John* is the figure in all the examples below. [We follow the text in Section 10.4.4, rich ontology version (60), p. 226]

Location phrases

John stood
- a. behind the store
- b. under the bridge
- c. on the stage
- d. * from the house. Path phrase!
- e. * to the store. Path phrase!

Other location predicates

The verbs are location predicates. Words identifying spatial relations are in italics.

a. Lassie lay *on* the bed.
b. The obelisk occupies *the top of* the hill.
b'. The obelisk is *on top of* the hill.
c. The lectern is *at the front of* the room.
d. The power cable lay *along the edge of* canal.
e. The ceremonial garlands *surround* her neck.
f. The children remained *in* the city.

LCS for location

		Location function
a.	Lassie lay on the bed.	
	BE-AT-LIE(LASSIE,ON(BED))	ON(BED)
b.	The lectern is at the front of the room.	
	BE-AT(LECTERN,FRONT(ROOM))	FRONT(ROOM)
c.	John is at the lectern.	
	BE-AT(JOHN,AT(LECTERN))	AT(LECTERN)
	BE-AT(JOHN, LECTERN)	AT(LECTERN) implicit!
d.	John remained at the lectern.	
	BE-AT-REMAIN(JOHN,LECTERN)	
	presupposition: He was there before....	

Become located

Location preds are states; combine with BECOME

Examples

a. Lassie arrived in Boston.
   BECOME [BE-AT(LASSIE,IN(BOSTON))]

b. The ball landed behind the couch.
   BECOME [BE-AT(BALL, BEHIND(COUCH))]
   What presupposition is missed?

c. The branch hit the window
   BECOME [BE-AT(BRANCH, WINDOW)]

d. The climbers reached the summit.
   BECOME [BE-AT(CLIMBER, SUMMIT)]

Outline

Definition of motion pred

A motion predicate entails motion and takes the full range of path phrases:

Path phrases

John walked
- a. to the store
- b. from the house.
- c. through the tunnnel
- d. from the house to the store through the tunnnel.

distance phrases

John
- a. walked
- b. swam
- c. jumped
- d. limped

five miles

Manner of motion [pattern]

go, come, run, walk, march, gallop, limp, fly, ...

Two analyses [one rejected!]

(a) Causative $\text{do}(\text{x}, [\text{RUN}(\text{x})])$ CAUSE $[\text{BECOME}\ [\text{BE-AT}(\text{x}, \text{y})]]$

(b) Motion pred $\text{do}(\text{x}, [\text{GO-RUN}(\text{x}, \text{F}_{\text{PATH}}(\text{y}))])$

Analysis (b): Van Valin and LaPolla (1997), rejecting Dowty, van Valin (1990). We follow Van Valin and LaPolla (1997) and the text in adopting analysis (b) for motion predicates. The presence of GO or one of its specializations licenses path phrases (and path measure phrases).

LCS for simple motion: I

Path functions

TO, THROUGH, ALONG, ACROSS, FROM are path functions. UNDER, BEHIND, ON, etcetera, are location functions. The argument of a path function can be either an individual or a location.

a. Lassie crawled through the minefield.

a.' do(L, [GO-CRAWL(L, THROUGH(M))]) [M is path function arg]

b. John ran to the bridge. [bridge is path goal]

b.' do(J, [GO-RUN(J, TO(B))])

c. John ran (?to) under the bridge. [under(bridge) is path goal]

c.' do(J, [GO-RUN(J, TO(UNDER(B)))])

d. John ran under the bridge. [under(bridge) locates running event]

d.' do(J, [GO-RUN(J)])

LCS for simple motion: II

Path functions

e. John ran from under the bridge. [under(bridge) is path source]

e.' $\text{do}(\text{J}, [\text{GO-RUN}(\text{J}, \text{FROM}(\text{UNDER}(\text{B})))])$

f. John ran from the bridge to the tower.

f.' $\text{do}(\text{J}, [\text{GO-RUN}(\text{J}, [\text{FROM}(\text{B}),\text{TO}(\text{T})])])$

g. John ran across the bridge.

g.' $\text{do}(\text{J}, [\text{GO-RUN}(\text{J}, [\text{ACROSS}(\text{B})])])$

Caused motion [pattern]

kick, *push*, *hit*, *teleport*, *bring*, ... A full range of path phrases. Causer $\neq$ theme. Manner of motion unspecified.

John { a. bumped / b. kicked / c. pushed } the box (from the door) to the wall.

push type

push	$\text{do}(\text{x}, [\text{PUSH}(\text{x},\text{y})])$ CAUSE $[\text{GO}(\text{y}, \text{F}_{\text{PATH}}(\text{z}))]$
kick	$\text{do}(\text{x}, [\text{KICK}(\text{x},\text{y})])$ CAUSE $[\text{GO}(\text{y}, \text{F}_{\text{PATH}}(\text{z}))]$
hit	$\text{do}(\text{x}, [\text{CONTACT}(\text{x},\text{y})])$ CAUSE $[\text{GO}(\text{y}, \text{F}_{\text{PATH}}(\text{z}))]$

Caused motion [examples]

kick, *push*, *hit*, *teleport*, *bring*, ... A full range of path phrases. Manner of motion unspecified. x caused y to move along path z.

Examples

a. John pushed the cart through the doorway.

a'. $\text{do}(\text{J}, [\text{PUSH}(\text{j},\text{c})])\ \text{CAUSE}\ [\text{GO}(\text{c}, \text{THROUGH}(\text{d}))]$

b. John threw the ball through the doorway.

b'. $\text{do}(\text{J}, [\text{THROW}(\text{j},\text{b})])\ \text{CAUSE}\ [\text{GO-FLY}(\text{b}, \text{THROUGH}(\text{d}))]$

c. John threw the ball under the bridge. [bridge is goal]

c'. $\text{do}(\text{J}, [\text{THROW}(\text{j},\text{b})])\ \text{CAUSE}\ [\text{GO-FLY}(\text{b}, \text{TO}(\text{UNDER}(\text{b})))]$

d. John drove Mary home (vehicle reading).

d'. $\text{do}(\text{J}, [\text{DRIVE}(\text{j},\text{x})])\ \text{CAUSE}\ [\text{GO-VEHICLE}_x(\text{m}, \text{TO}(\text{HOME}(\text{m})))]$

d'. $\text{do}(\text{J}, [\text{DRIVE}(\text{j},\text{x})])\ \text{CAUSE}\ [\text{GO-VEHICLE}_x(\text{m}, \text{TO}(\text{HOME}(\text{j})))]$

Caused locatedness (*put* type)

put, *insert*, *place*, *stand*, ... : source and goal not possible

* He put the box to the closet. (= CAUSE (BE-AT (...)))

put type

put on	x CAUSE [BECOME [BE-AT(y, ON(z))]]
insert	x CAUSE [BECOME [BE-AT(y, IN(z))]]
lay	x CAUSE [BECOME [BE-AT-LIE(y, ON(z))]]
	lay is the causative of *lie*

No path argument, so no distance phrases:

push		He { pushed the cart / drove the car / threw the ball } 150 yards.
put	*	He put the cart 5 miles.

Caused locatedness

put, *insert*, *place*, *stand*, ... : source and goal not possible

Examples

a. John put the book on the table.

a'. j CAUSE [BECOME [BE-AT(b, ON(table))]]

b. John put the book under the table.

b'. j CAUSE [BECOME [BE-AT(b, UNDER(table))]]

c. John inserted the key in the lock.

c'. j CAUSE [BECOME [BE-AT(k, IN(l))]]

d. John inserted the credit card under the carbon paper.

d'. j CAUSE [BECOME [BE-AT(cc, IN(UNDER(cp)))]]

lexical entry for *insert*

e. x CAUSE [BECOME [BE-AT(y, IN(z))]]

Summary

Know these distinctions

Motion preds (*run, crawl*)	Location preds (*stand, lie*)	MPs take path phrases
Motion preds	Become-located preds (*land, arrive, hit*)	BLs are achievements BLs no paths
MPs	Caused MPs (*push, throw*)	MPs: 2 args (X,Y,Z) CMPs: 3 args (X,Y,Z)
CMPs	*put*-preds (*put, lay*)	3 args, no paths

LCS Summary

Motion

Motion	do(x, [go(x, path)])
Become-located	become [be-at(x, location)]
Cause motion	do(x) cause [go (y, path)]]
cause become-located	x cause [become [be-at(y, location)]]

van Valin, Robert D. 1990.
Semantic parameters of split intransitivity.
Language 66:221–260.

Van Valin, Robert D., and Randy J. LaPolla. 1997.
Syntax: Form, Meaning and Function.
Cambridge University Press.