

## **Lexical Semantics of Verbs III: Causal Approaches to Lexical Semantic Representation**

**Reading:** L&RH 2005, Section 4.3; Van Valin & Wilkins 1996, especially Sections 11.2–11.3; Levin’s “Notes on the Causative Alternation”, written for another course, downloadable from bSpace; also suggested Croft 1998.

### **1 An introduction to the causal approach: *Breaking and hitting yet again***

Intuitively, what makes *break* and *hit* distinct is that only *break* is perceived as inherently causative, as embodied in the proposal that it, but not *hit*, has a complex event structure (see Lecture Notes 2).

The causal approach takes the facets of verb meaning relevant to argument realization to involve the causal structure of the events denoted.

This approach naturally accommodates notions such as agent, patient, and instrument, which figure centrally in semantic role inventories;

That is, the causal approach is often implicitly assumed in semantic role accounts. However, it also defines other less widely used notions, such as “force recipient”.

FOUNDATIONAL ASSUMPTION: Causation is the primary framework for understanding events. Contra proposals to define events in terms of spatiotemporal extension, i.e. aspect:  
“Spatiotemporal extension is neither a necessary nor a sufficient condition for defining events.” (Croft 1991:159, though Croft now argues for a hybrid approach (2009))

“Events are identical if and only if they have exactly the same causes and effects. Events have a unique position in the framework of causal relations between events in somewhat the way objects have a unique position in the spatial framework of objects.” (Davidson 1980:179)

(1) Three models of causal relations:

- a. events cause other events (Davidson 1967; Dowty 1979) → Often adopted
- b. individuals bring about events (Gruber 1976)
- c. individuals act on other individuals (Croft 1991, 1998; Talmy 1976)

THE QUESTION: Precisely what causal notions are relevant to argument realization?

### **2 The causal chain model of events**

One instantiation of the causal approach models events in terms of individuals acting on individuals, thus involving causal chains, consisting of a series of segments (or “atomic events”), each relating two participants in the event; a single participant may be involved in more than one segment. (See Croft 1991, 1994, 1998, DeLancey 1984, Langacker 1987, Talmy 1976, among others.)

Verbs name a “self-contained” series of segments of a causal chain:  
 They “... define as much as possible ‘naturally’ individuated events.” (Croft 1994:36)

AN IMPORTANT PROPERTY: The relation between individuals is often asymmetric.

Atomic “events ... have causal directionality, and they can be linked into a series of causally related events such that the endpoint or affected entity of the causally-preceding atomic event is the initiator of the next atomic causal event. This series I will call a CAUSAL CHAIN.” (Croft 1991:169)

— “each shift in the ‘force’ from one entity to another represents a new segment in the causal chain.” (Croft 1991:170)

— “directionality of the causal chain is determined by the direction of ‘force.’” (Croft 1991:170-1)

(2) The Idealized Cognitive Model of a Simple Event:

- a. simple events are segments of the causal network;
- b. simple events involve individuals acting on other individuals (transmission of force);
- c. transmission of force is asymmetric, with distinct participants as initiator and endpoint;
- d. simple events are nonbranching causal chains;
- g. simple events are independent; that is, they can be isolated from the rest of the causal network

(Croft 1991:269; see also Croft 1991:173, (e)-(f) dropped, following Croft 1998:47-48)

- This approach privileges the event type denoted by transitive *break* and suggests that it is such events that are prototypically denoted by transitive verbs:

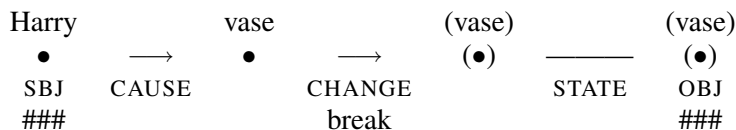
“The prototypical event type that fits this model is unmediated volitional causation that brings about a change in the entity acted on (i.e., the manifestation of the transmission of force) ... Other event types must be ‘coerced’ into this model.” (Croft 1991:173)<sup>1</sup>

(3) *Harry broke the vase* (Croft 1994:38, (12); modelled with a three segment causal chain:

(i) Harry acts on the vase (NOTE: indicated as CAUSE in (3))

(ii) the vase changes state

(iii) the vase is in a result state (i.e., broken)



- Important properties of causal chains defining events:

— DIRECTIONALITY, arising from the asymmetric transmission of force

— DELIMITATION (from rest of causal network)

“In order for an event to be easily isolable from the causal network, it must be conceptualized as not having a clear prior cause and not itself causing another event — that is, the event must have a clear starting point and a clear endpoint. These properties are satisfied by the cause-become-state event sequence.” (Croft 1990:58)

<sup>1</sup>On the notation: “a dot indicates a participant; an arrow indicates a relationship of transmission of force, which can be described by the capitalized label just below it; a line without an arrowhead indicates a noncausal (stative) relation; a parenthesized dot indicates that it is the same participant as in the preceding causal (or noncausal segment)” (Croft 1994:37, n. 5).

“... the prototypical transitive event is one which can be traced back to a single cause from which an unbroken chain of control leads to the effect. This ultimate cause can only be an act of volition on the part of a (thus defined) prototypical agent. This act of volition directly engenders an action on the part of the agent, which may in turn be extended through an instrument, and then impinges directly upon the outside world.” (DeLancey 1984:207)

- DeLancey shows deviations from the prototype aren't necessarily expressed in transitive clauses.

EXAMPLE: Inactive Causation — “the chain of causation cannot be traced back to a comprehensible ultimate cause.” (DeLancey 1984:207)

(4) He died from the poison.

Although the poison is the cause of the victim's death, it isn't the ultimate cause of the death because it must have gotten into the victim's system in some way.

- The notions “agent” and “patient” can be defined in terms of the starting point and endpoint, respectively, of the prototypical event; they are natural delimiters: an event with an agent and patient is maximally delimited (Croft 1994:39).

— Assuming free will, there is no antecedent transmission of force to agent.

— As patient is in a result state and states don't lead to other events, there is no subsequent transmission of force.

- Some possible event-types encoded as simple verbs (from Croft 1991, 1998):

Initiator		Endpt		(Endpt)		(Endpt)	
•	→	•	→	(•)	——	(•)	
	CAUSE		CHANGE		STATE		
###		###		###		###	CAUSATIVE
							INCHOATIVE
							STATIVE
###				###			VOLITIONAL ACTIVITY
		###		###			NONVOL ACTIVITY

## 2.1 Causal chains and the thematic hierarchy

- Fillmore (1968) stresses the priorities among a verb's coarguments with respect to their potential realization as subject.

- (5)
- The door opened.
  - Dana opened the door.
  - The chisel opened the door.
  - Dana opened the door with a chisel.
  - \* The door opened by Dana.
  - \* The chisel opened the door by Dana.

- (6) If there is an A [=Agent], it becomes the subject; otherwise, if there is an I [=Instrument], it becomes the subject; otherwise, the subject is the O [=Objective, i.e., theme/patient]. (Fillmore 1968:33)

- IMPLICATION: There are relations of semantic prominence among arguments.
- AN INSTANTIATION OF THIS IDEA: A THEMATIC HIERARCHY—a ranking of semantic roles.

EXAMPLE: The thematic hierarchy in (7) together with the subject selection rule in (8) accounts for the grammaticality patterns in (5).

(7) Agent > Instrument > Theme/Patient

(8) The argument of a verb bearing the highest-ranked semantic role is its subject.

CONSEQUENCE: A lexical semantic representation must be designed to accommodate semantic prominence relations.

- The causal approach provides insight into the thematic hierarchy:

“Instead of a thematic role hierarchy, a ranking of participants in terms of their force-dynamic relations to each other is argued to be critical for linking, in fact more important than type of thematic role in the usual sense. One participant outranks another if it is antecedent to the other in the causal chain (in terms of transmission of force).” (Croft 1998:23)

“The subject and the object (if there is one) are at each end of the segment of the causal chain, the subject causally preceding the object . . . The causally prior end of the verbal segment represents the INITIATOR and the causally later end the ENDPPOINT of the verbal segment. That is to say, subject and object delimit the verbal segment of the causal chain.” (Croft 1991:173)

NOTE: The causal approach provides one way of understanding the thematic hierarchy, but there are others, which arise because thematic hierarchies have been posited to explain a myriad of phenomena; see L&RH (2005:Chapter 6).

### 3 The notion of force recipient

- The notion “force recipient”, which emerges from the causal chain approach, allows for a finer grained characterization of the semantic types of English objects, a characterization that is relevant for understanding crosslinguistic differences in the transitive verb inventory.
- This notion not only distinguishes between the objects of *hit* and *break*, but also sets them apart from the objects of certain other verbs types.

#### 3.1 Identifying force recipients

- A DIAGNOSTIC: A force recipient can be *Y* in the frame *What X did to Y was . . .*

(9) Change of state verbs:

- What Harry did to the window was break it.
- What Tracy did to the soup was warm it.
- What Dale did to the lights was dim them.

- (10) Surface contact verbs:
- a. What Harry did to the window was hit it.
  - b. What the man did to the donkey was beat it.
  - c. What the waiter did to the glasses was wipe them.
  - d. What they did to their children's hair was rub it.
- (11) Verbs of exerting force:
- a. What Devon did to the cart was push it.
  - b. What Drew did to his sister's braid was pull it.
  - c. What Pat did to the dog's leash was tug/yank it.
- (12) Perception/cognition/emotion verbs:
- a. \* What Kelly did to the movie was see it.
  - b. \* What Popeye did to spinach was love it.
  - c. \* What the child did to the toy was want it.

NOTE: Jackendoff (1987:394, 1990:125-30) considers this frame a diagnostic for “patient”, which he defines as an “affected entity” (see also Fiengo 1980:37). As he notes, however, the NPs picked out by this diagnostic do not correspond precisely to those picked out by other “affectedness” diagnostics, which select patients in the strict sense of undergoing a change of state.

- “Force recipient” allows a unified generalization concerning resultatives with transitive verbs.

The distribution of result XPs with transitive verbs plus objects:

— Change of state verbs can only predicate a result XP of their object.

— Other classes of transitives that also only predicate a result XP of their object include:

– Verbs of surface contact (e.g., *rub*, *sweep*, *wipe*)

– Verbs of exerting force (e.g., *pull*, *push*, *tug*, *yank*)

Both have objects that are force recipients but do not change state.

- (13) a. She might employ it [her body] as a weapon—fall forward and **flatten** me wafer-thin. (D. Ephron, *Big City Eyes*, Putnam's, New York, 2000, p. 92)
- b. She was **wiping** the mirror free of steam ... (E. George, *Missing Joseph*, Bantam, New York, 1993, p. 251)
- c. He **pulled** the glass door tightly shut behind them ... (A. Cleeves, *Murder in My Backyard*, Fawcett, New York, 1991, p. 119)

THE GENERALIZATION: The result XP is predicated of the NP denoting the argument of a transitive verb which is the recipient of a transmitted force, if there is one.

### 3.2 Force recipients and transitivity

Tsunoda (1981, 1985:388-389) introduces an implicational hierarchy of semantic classes of two-argument verbs organized according to how likely their members are to be transitive in a language. Part of the hierarchy is given in (14).

- (14) Tsunoda’s Hierarchy (simplified):  
change of state verbs > surface contact verbs > perception/cognition/emotion verbs
- (15) Perception/cognition/emotion verbs: hear, see, smell, know, enjoy, fear, hate, like, ...

This hierarchy may be attributed to semantic determinants of argument realization, with the hierarchy reflecting the priorities among them.

TSUNODA’S PROPOSAL: The hierarchy is organized in terms of a decrease in “affectedness” of the second argument, based on an assessment of the semantic components of transitivity suggested by Hopper and Thompson (1980). (See Malchukov (2005) for a refinement of Tsunoda’s actual hierarchy, suggesting it collapses two dimensions of variation: affectedness and agentivity; see Beavaers (2006) for discussion of affectedness from another perspective.)

AN ALTERNATIVE: The hierarchy reflects the interaction of “changes state” and “force recipient”.

NOTE: Perception/cognition/emotion verbs will not be considered in detail, but their status is most likely attributable to their stativity. (See Bossong 1998, Haspelmath 2001, and Onishi 2001 for more on how these verbs distribute across the transitive and intransitive verb classes crosslinguistically.)

### 3.2.1 Evidence for the position of surface contact verbs in Tsunoda’s hierarchy

These verbs are simple event verbs, describing contact with a surface, without entailing change.

- (16) a. Canonical surface contact verbs: hit, kick, shoot, slap, ...  
b. “Extended” members of the class: mow, rake, rub, scratch, sweep, wipe, ...

Nevertheless their placement in Tsunoda’s hierarchy may seem surprising:

it is intended to capture the observation that these verbs are not transitive in every language, though they are in many languages.

- LHASA TIBETAN: The counterpart of English *hit* is not transitive: the argument denoting the surface contacted takes a locative marker. Concepts expressed by other surface contact verbs involve verb-noun combinations (DeLancey 1995, 2000).

- (17) shing\*(-la) sta=re-s gzhus-pa.  
tree-LOC axe-ERG hit  
'hit the tree with an axe' (DeLancey 1995: (18))

- (18) nga-s blo=bzang=la rdog=rdyag gzhus-pa yin  
I-ERG Lobsang-LOC kick<sub>N</sub> hit/throw-PERF/CONJUNCT  
'I kicked Lobsang' (DeLancey 1995: (20))  
cf. English: I gave Lobsang a kick (= 'I kicked Lobsang')

- INGUSH: The counterparts of certain English surface contact verbs are also expressed via verb-noun combinations (Nichols 1982:447, 1984:188). Again the surface is expressed in an oblique case—a case-marking pattern common across Caucasian languages (Nichols 1984:188).

- (19) *tuop tuoxan* 'rifle hit' means 'shoot', not 'beat with a rifle' (Nichols 1984:189).

- HEBREW: The surface is expressed in a PP headed by the locative preposition *b*.

(20) *ba* ‘kicked’, *dafaq* ‘knocked/beaten’, *halam* ‘beaten/hit’, *hika* ‘beaten/hit’, *naga* ‘touched’, *xavat* ‘hit’, ... (Botwinik-Rotem 2003:10, Halevy 2008:63)

- VIETNAMESE: Surface contact verbs may express the surface as an object or take a cognate object with the surface expressed in a PP.

(21) *da* ‘kick’, *dam* ‘punch’, *thui* ‘punch’, *cao* ‘scratch’, *cau* ‘pinch/nip’, *nen* ‘beat’, *quai* ‘beat’, *can* ‘bit’, *danh* ‘hit’, *tat* ‘slap’, *vuot* ‘stroke/fondle’, *liem* ‘lick’, *hon* ‘kiss’, *cu* ‘tickle’, *phang* ‘strike with a stick’, *quat* ‘strike’, ... (Pham 1999:233)

(22) Ti da toi.  
Ti kicked me  
‘Ti kicked me.’ (Pham 1999:232, (10a))

(23) Ti da mot da.  
Ti kicked a kick  
‘Ti kicked a kick.’ (Pham 1999:233, (10b))

(24) Ti da [mot da] [vao toi].  
Ti kicked a kick on me  
‘Ti kicked me a kick.’ (Pham 1999:233, (10c))

### 3.2.2 Justifying the position of surface contact verbs in Tsunoda’s hierarchy

Why are surface contact verbs most likely to be transitive after change of state verbs?

DIFFERENTIATING THE SECOND PARTICIPANT OF THE VARIOUS VERB TYPES:

- Change of state verbs: both a force recipient and changes state.
- Surface contact and exerting force verbs: a force recipient, but does not change state.
- Perception, cognition, emotion verbs: neither a force recipient, nor changes state.

- The notions “changes state” and “force recipient” matter for transitivity.
- “Changes state” has top priority, most likely because it is defined over event structures.

Change of state verbs are at the top of the transitivity hierarchy because as complex event verbs, the argument that changes state corresponds to a structure argument and, thus, may be defined with respect to the proposed event structures via reference to the predicate BECOME.

- “Force recipient” has priority over other properties of second participants.

Surface contact verbs, like change of state verbs, involve the asymmetric transmission of force from one entity to a second, but unlike them do not entail a change in the second entity. However, most surface contact verbs denote conventional means of achieving particular results (e.g., hitting can cause damage), so they are associated with a cancellable implicature that the force recipient undergoes a change (Talmy 2000).

Apparently, in many languages this qualifies any force recipient for objecthood, even when part of a simple event, perhaps because the implicature creates the impression that surface contact verbs fit the “changes state” mold.

Hence, these verbs are often among the transitives of a language.

#### 4 What makes a causative alternation verb? (L&RH 1995:Chapter 3)

Usually discussions of how *break* and *hit* differ focus not on the semantic role of their object, but on the notion “causative”: transitive *break* is said to be causative, *hit* is not.

THE REASON: A hallmark of *break*, but not *hit*, is its participation in the causative alternation: it is among the verbs found in transitive/intransitive pairs where  $V_{trans} = \text{'cause to } V_{intrans}$ '.

- (25) a. Pat broke the window./The window broke.  
b. Tony opened the door./The door opened.  
c. Kelly cooled the soup./The soup cooled.  
d. Sam cooked the fish./The fish cooked.

- (26) Pat hit the window./\*The window hit.

How can causative alternation verbs best be characterized?

##### 4.1 Internally and externally caused eventualities

What property of *break* makes its transitive use causative?

An answer to this question emerges from contrasting *break* with intransitive verbs such as *play*, which are NOT regularly paired with a transitive causative use.

- (27) Animate agentive argument:
- a. The children played./\*The teacher played the children.  
(on the interpretation ‘The teacher made the children play.’)
- b. The politician spoke./\*The press spoke the politician.  
(on the interpretation ‘The press made the politician speak.’)
- c. The athletes jogged./\*The coach jogged the athletes.  
(on the interpretation ‘The coach made the athletes jog.’)

Agentive intransitive verbs do not participate in the causative alternation.  
But the distinction cannot be equated with agentivity;  
there are nonagentive verbs which do not participate in the alternation.

- (28) Animate nonagentive argument:
- a. Charlotte blushed./\*The rude comment blushed Charlotte.  
b. Kelly coughed./\*The medicine coughed Kelly.  
c. The crowd laughed./\*The comedian laughed the crowd.

- (29) Inanimate nonagentive argument:
- a. The stream bubbled./\*The rocks bubbled the stream.  
b. The embers glowed./\*The draft glowed the embers.  
c. The chimney smoked./\*The draft smoked the chimney.



The relevant distinction is between verbs denoting internally caused eventualities and verbs denoting externally caused eventualities.

- An INTERNALLY CAUSED EVENTUALITY “cannot be externally controlled” (Smith 1970:107), but is conceived of as arising from inherent properties of its argument. An inherent property of the argument is “responsible” for the eventuality denoted by an internally caused verb.

Internal causation subsumes agentivity: monadic agentive verbs are internally caused.

However, not all internally caused verbs are agentive.

The prototypical internally caused eventuality involves an agentive argument with a self-controlled body acting volitionally.

Internally caused verbs that depart from the prototype tend to exert strong selectional restrictions on their subject since the eventuality they denote must result from inherent properties of the verb’s argument, and thus the argument must have the requisite properties.

- EXTERNALLY CAUSED EVENTUALITIES inherently involve an external cause with immediate control over the event: agent, natural force, or circumstance.

The core externally caused verbs are verbs of change of state and change of position:

(30) Jespersen’s “Move” and “Change” Verbs:

- a. bounce, move, roll, rotate, spin, . . .
- b. bake, blacken, break, close, cook, cool, dry, freeze, melt, open, shatter, thaw, thicken, whiten, widen, . . .

Externally caused verbs cannot be equated with verbs of change of state:  
there are internally caused verbs of change of state (Wright 2001, 2002).

- (31) a. The cactus bloomed/blossomed/flowered early.
- b. \* The warm weather bloomed/blossomed/flowered the cactus early.

- (32) a. The logs decayed.
- b. \* The humid weather decayed the logs.

## 4.2 Implications for the representation of verb meaning

- If the key semantic property of verbs showing the causative alternation such as *break* is external causation, then there is a sense in which such verbs are inherently causative; that is, they are naturally compatible with a complex event structure, as also argued in Lecture Notes 2.

(33) *break*: [ [ x ACT ] CAUSE [ BECOME [ y <BROKEN> ] ] ]

Not only are these result verbs, but their root represents an externally caused state—a result state.

- No externally caused result state is part of the meaning of verbs like *hit* with manner roots; thus, they are not compatible with a complex, causative event structure.

- Transitive and intransitive *break* would have the same lexical semantic representation; intransitive *break* involves lexical binding of the external cause (L&RH 1995) or reflexivization (Koontz-Garboden 2007, 2009; see also Chierchia 2003).

Evidence from the morphological form of causative pairs: The use of reflexive morphology.

(34) Italian:

- Gianni ha aperto la porta.  
'Gianni opened the door.'
- La porta **si** è aperta.  
'The door opened.'

(35) Russian:

- Anna otkryla dver'.  
'Anna opened the door.'
- Dver' otkrylas'.  
'The door opened.'

(36) Hebrew:

- Dan yibeš et ha-begadim.  
Dan dried ACC the-clothes  
'Dan dried the clothes.'
- Ha-begadim **hityabšu**.  
the-clothes dried  
'The clothes dried.'

### 4.3 Consequences of the internally/externally caused eventuality distinction

- The behavior of apparent synonyms (Atkins & Levin 1995).

If two apparently synonymous verbs behave differently with respect to the causative alternation, then there should be evidence of a corresponding difference in their classification.

- She shook./I shook her.
  - She shuddered./\*I shuddered her.
- (38) a. Things that *shudder*: people, animals, earth, machines/engines  
(have "self-controlled" or "autonomously controlled" bodies )
- Things that *shake*: the above and leaves, furniture, dishes, ...

*shudder* describes an involuntary emotional or physical reaction, which is itself a response to an external stimulus. The reaction is internally initiated; the indirect, external stimulus may be expressed in an *at* phrase.

- ... shuddered at the thought of drowning in such loneliness ...  
(Oxford Corpus; 5Gates)
- ... shuddering at tales of the Big Bad Wolf ... (Oxford Corpus; OnEdge)

Pairs like *shake/shudder* show some events in the world are open to alternative conceptualizations.

Similarly, variation might be expected between languages with respect to the classification of purported translation equivalents when alternative conceptualizations are available.

- Deadjectival alternating verbs are based on stage-level adjectives (Kratzer 1995).

(40) blacken, brighten, clear, cool, deepen, dim, dry, empty, flatten, lengthen, ripen, roughen, shorten, slow, smarten, smooth, thicken, toughen, warm, whiten, widen, ...

Loss of Ambiguity:

— *smart* can mean ‘intelligent’ or ‘well and fashionably dressed’

but *smarten* is related only to ‘well and fashionably dressed’

— *tough* can mean ‘difficult’ or ‘resistant to tearing’

but *toughen* is related only to ‘resistant to tearing’ (Dowty 1979)

## 5 What is an agent?

Causal approaches draw attention to the notion “agent”, e.g., Croft’s prototypical transitive event.

THE QUESTION: How are agency and causation related?

- Not all verbs that may take an agent are causative: e.g., *hit* and other surface contact verbs.

- Not all causative verbs are necessarily agentive:

— Causative alternation verbs may take instrument and natural force subjects.

- (41) a. Kelly dried the clothes.  
b. The heater dried the clothes.  
c. The wind and sun dried the clothes.

— And the agency of an animate subject can often be denied.

- (42) The boy broke the window (accidentally).  
(Van Valin & Wilkins 1996:307, (4a))

— Even *kill*, another verb commonly assumed to be agentive (and causative), does not require an agent, contrasting with *murder*, which is (Van Valin & Wilkins 1996).

- (43) a. Larry killed the deer.  
b. Larry intentionally killed the deer.  
c. Larry accidentally killed the deer.  
d. The explosion killed the deer.  
(Van Valin & Wilkins 1996:309, (9); adapted from Holisky (1987:118, (15))

- (44) a. Larry murdered his neighbor.  
 b. \*Larry inadvertently murdered his neighbor.  
 c. \*The explosion murdered Larry's neighbor.  
 (Van Valin & Wilkins 1996:310, (10))

As Van Valin & Wilkins point out, elaborating on Holisky (1987), verbs which require agents as subjects such as *murder* are much rarer than those which allow agents as subjects, but also allow various nonagentive causer subjects, such as *kill*.

“I would argue that the meaning of agent is often not a property of the semantic structure of the predicate at all. ... Agent interpretation often arises, rather, from the intersection of the semantics of the clause (the semantics of both the actor NP and the predicate) and general principles of conversation (cf. Grice, 1975).” (Holisky 1987:118-119)

Holisky proposes agentivity derives from a pragmatic principle:

- (45) PRAGMATIC PRINCIPLE: You may interpret effectors and effector-themes which are human as agents (in the absence of any information to the contrary). (Holisky 1987:118-119)

where an “effector” is the semantic role that Van Valin attributes to the subject of verbs like *kill*.

This point has significant implications for the characterization and analysis of argument realization regularities: for example, it raises the question whether instrument subjects are indeed “instruments” or whether they should instead simply be considered effectors?

- (46) a. The rock broke the window.  
 b. The crane loaded the truck.

## 6 Conclusion

- The causal approach accommodates notions such as agent, patient, and instrument, which figure prominently in semantic role inventories.
- This approach also gives rise to less widely used semantic notions, such as “force recipient”, which figures in the characterization of transitive verb inventories and other phenomena.

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