

The Tightness of Resultatives: Implications for Causation

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1 Introduction

- Most discussions of the semantics of English transitive resultatives refer to the notion ‘cause’.

(1) Last night, the dog **poked me awake** every hour to go outside. (G. Dunford, “Charity’s for the Birds”, *The Toronto Sun*, November 27, 1994, p. 6)

- **Why?** The readily available paraphrase of the form ‘*causing event CAUSE caused event*’.

(2) For (1): ‘The dog poked me causing me to awake’.

- In (1) the causing event—poking—and the caused event—awakening—share a participant: the postverbal NP *me* is understood both as the object of the verb, i.e. a participant in the causing event, and as holder of the result state attained in the caused event.

- (3), which has the same postverbal NP–adjective pair as (1), equally has a causative paraphrase:

(3) ... the roosters that scratch in the yard of Brastagi’s best hotel **crowed me awake** that dawn a few months ago ... (T. Robbins, “Treks for the Sophisticated Traveler”, Section 6, Part 2, *The New York Times*, March 16, 1986, p. 8)

(4) CAUSATIVE PARAPHRASE: ‘The roosters crowed causing me to awake’.

- Nevertheless, (3) lacks such an obvious link between its causing and caused events: The postverbal NP is not understood as the verb’s object in such ‘nonselected NP’ resultatives.

(5) *The roosters crowed me. (cf. The dog poked me.)

- In (3) the causing event—the crowing—does not involve physical manipulation of any entity, not even the entity that attains the result state; the action need not even be directed at a particular entity: the roosters could simply be crowing for their own reasons.

- Precisely because they have a causative interpretation despite the nonselected postverbal NP, such resultatives are particularly relevant to a theory of causation (yet they have not received sustained attention in this context; but see Kratzer 2005).

- The selected and nonselected NP subtypes are recognized for their usefulness to the talk’s goals; many formal accounts analyze all resultatives as having nonselected NPs; see Hoekstra (1988, 1992) for syntactic arguments and Grøne (2014) for semantic arguments.

The major questions: How best to characterize the relation between the subevents so as to:
— encompass both selected and nonselected NP resultatives and
— shed light on why the postverbal NP is understood as selected or not.

Larger goal: To exploit a better understanding of resultatives to illuminate the notion of causation.

Focus: Transitive resultative constructions whose result XP is headed by an adjective, i.e. constructions of the form ‘NP1 V NP2 AP’, where AP is predicated of NP2;
— ignore constructions of the form ‘NP1 V NP2 PP’, where PP is predicated of NP2
— ignore intransitive constructions of the form ‘NP1 V XP’, where XP is predicated of NP1
(To limit scope will also ignore transitive resultatives with reflexive pronoun postverbal NPs.)

The source of the data: A collection of about 1350 naturally occurring transitive resultative constructions predominantly drawn from newspapers and fiction written since the mid-1980s; some recent web examples are included to explore particular verb–result AP combinations further.

A caution: Since the examples are not drawn from a ‘balanced’ corpus designed to be representative of current English, they bear primarily on claims about possible options.

2 A first look at the relation between the causing and caused events

- Not only are transitive resultatives often analyzed as causatives (e.g., Dowty 1979, Jackendoff 1990), but their constituent subevents are taken to show the tight semantic integration characteristic of the subevents of so-called ‘lexical causatives’ (RH&L 2001:783).

- (6) a. The waitress comes back, **wiping the silverware dry** with a cloth napkin . . . (M.G. Jaffe, *Dance Real Slow*, Farrar Straus Giroux, New York, 1996, p. 24)
b. CAUSATIVE PARAPHRASE: ‘The waitress wiped the silverware causing it to be dry’.
- (7) a. LEXICAL CAUSATIVE: The waitress dried the silverware.
b. CAUSATIVE PARAPHRASE: ‘The waitress caused the silverware to be dry.’

- Both constructions lack a causative element: they are ‘concealed causatives’ (Bittner 1999).

- But there is a difference:

- Lexical causatives explicitly mention the caused event (the verb); the causing event is implicit.
- Resultatives explicitly mention both the causing event (the verb) and the caused event (the XP).

- The tight integration between the subevents of concealed causatives is said to enable the subevents to form a single, but complex event.

- This event structure receives syntactic support: lexical causatives—and resultatives—show evidence of monoclausal structure (Shibatani 1976).

- And the link between subevents in lexical causatives is tighter than in periphrastic causatives: some situations can be described by a periphrastic causative, but not by the corresponding lexical causative (e.g., Dowty 1979, Hall 1968, Shibatani 1976).

- (8) a. The low air pressure caused the water to boil.
b. * The low air pressure boiled the water.
(Hall 1965:28, (2-33)–(2-34))

- Similarly, some situations describable by a periphrastic causative lack a corresponding resultative.

(9) The dog caused me to awake by scratching at the bedroom door.
 ≠ The dog scratched me awake. (requires the dog to actually scratch the sleeper)

- Shibatani (1976:31) characterizes the type of causation in lexical causatives narrowly as ‘manipulative’ causation: indeed, in many such causatives the causer physically manipulates the causee.

- More often the difference in tightness between periphrastic and lexical causatives receives a broader characterization: does the relation between the subevents require so-called ‘direct causation’—as lexical causatives are said to do—or does it also allow for ‘indirect causation’—as in periphrastic causatives (e.g., Bittner 1999, Fodor 1970, McCawley 1978, Shibatani 1976, Smith 1970, Wolff 2003, but see Neeleman & van de Koot 2012).

- Resultatives also are said to involve ‘direct causation’ (e.g., Bittner 1999, Carrier & Randall 1993, Dowty 1979, Goldberg 1995, Jackendoff 1990, Kratzer 2005, L&RH 1999, RH&L 2001).

- Bittner hypothesizes that this tight link is characteristic of concealed causatives:

(10) If a causal relation is syntactically concealed (only its arguments are overtly expressed), then it is semantically direct (no intermediate causes). (Bittner 1999:2, (C))

- Manipulative causation represents ‘prototypical’ direct causation: a volitional, animate agent physically manipulates an entity to bring about a physically instantiated state in it (Croft 1991:168).

- There are various overlapping characterizations of ‘direct’ causation; see Wolff (2003:4, Table 1).

- Often-adopted is Wolff’s (2003) definition of direct causation:

(11) Direct causation is present between the causer and the final causee in a causal chain (1) if there are no intermediate entities at the same level of granularity as either the initial causer or final causee, or (2) if any intermediate entities that are present can be construed as an enabling condition rather than an intervening causer. (Wolff 2003:4–5)

(Wolff (2003) takes ‘facilitating’ instruments to qualify as enabling conditions, contrasting them with ‘intermediary’ instruments, which can perform an action independently; see Marantz 1984:247, Ono 1992, Wojcik 1976, Wolff et al. 2010).

- Other attempts to define direct causation refer to a lack of ‘intermediate’ or ‘intervening causes’ (Bittner 1999:2, Kratzer 2005:196–198) or ‘intervening events’ (RH&L 2001:783)

- Such no-intervening-cause conditions ensure a tight link between the causing and caused subevents.

- It is unsurprising that existing characterizations of direct causation reference notions that pertain to the ‘middle’ of a causal chain—where the causing and caused events come together: ‘intermediate’ or ‘intervening event’, ‘intervening causer’, or ‘intermediate entity’.

- Since transitive resultatives, unlike lexical causatives, explicitly reference the causing event, they provide a better laboratory for investigating what direct causation entails.

- This talk uses the term ‘tightness condition’ between the causing and caused events to stay open about the best characterization of ‘direct causation’ (cf. Neeleman & van de Koot 2012) and to avoid any accompanying preconceptions.

3 The result state constrains the causing event—and the verb—in the resultative

- As the result state is brought about by the causing event, this event must be able to lead to that state, while conforming to the tightness condition.
- **A key observation:** Each result state, represented by a result AP, constrains the set of possible co-occurring causing events—and, thus, possible verbs—in the associated resultatives.
- Looking at the attested verbs representing the causing event for a given result AP should provide insight into the tightness condition.
- The preponderance of result states in the corpus are physically instantiated:

(12) PHYSICAL STATES: awake, bare, barkless, black, blank, bloody, clean, clear, closed, coarse, dark, dry, empty, flat, full, free, hoarse, open, shut, smooth, ...

(13) MENTAL STATES: alert, calm, clueless, crazy, loopy, speechless, witless, ... [ignored here]

- As a physical state in an entity is brought about by physically manipulating it, the co-occurring causing event must necessarily involve such an action (magic aside!).
- Concomitantly, the verbs in such resultatives are predicted to lexicalize such actions.
- Indeed, most attested verbs lexicalize actions that involve physical manipulation: various forms of surface contact, impact, or force exertion.
- Such verbs tend to be ‘manner’ verbs rather than ‘result’ verbs (L&RH 1991, RH&L 1998, 2010).
 - Result verbs: specify a change in a scalar valued property of an entity (HK&L 1999); they describe the attainment of a result state (e.g., *clean, empty, open, remove, put*).
 - Manner verbs: specify a manner of carrying out an action (e.g., *pound, pour, sweep*); many manners are typically intentionally performed to bring about one or more result states, although the result isn’t entailed (Talmy 2000).

(14) I just wiped the counter, but it’s still dirty/sticky/covered in crumbs.

(15) Shall I wipe, scour, or scrub the counter today?

- A small number of resultatives have a result verb; their result APs further specify the result lexicalized in the verb (e.g., *fill NP full*), consistent with a constraint against having an action leading to two result states (Goldberg 1991:368, Tenny 1994:68). These are ignored.
- In many resultatives, the result AP is combined with a manner verb which lexicalizes an action intended to bring about the relevant result.

(16) SELECTED NP RESULTATIVE:

- a. #I just wiped the counter clean, but it’s still dirty. (Contradiction)
- b. #I just wiped the counter clean, but the wiping had nothing to do with the cleanness. (Contradiction)

(17) NONSELECTED NP RESULTATIVE:

- a. #I just poured the mug full of coffee, but it's still empty. (Contradiction)
- b. #I just poured the mug full of coffee, but the pouring had nothing to do with the mug's fullness. (Contradiction)

• As such actions are typically performed by an animate, volitional agent, such resultatives conform to the prototypical form of direct causation.

• Nevertheless, what matters is not whether the causer intends to carry out the action to bring about the result state, but rather whether this action is a usual way of bringing this state about.

— The resultatives in (18) and (19) illustrate this point.

— The subject of (18)—the sound emitter—is animate, but is not making noise to wake someone.

(18) ... the roosters that scratch in the yard of Brastagi's best hotel **crowed me awake** that dawn a few months ago ... (T. Robbins, "Treks for the Sophisticated Traveler", Section 6, Part 2, *The New York Times*, March 16, 1986, p. 8)

— In (19) the sound emitter is inanimate and, thus, lacks intention.

(19) At exactly midnight, the phone beside Helma's bed **jangled her awake**. (J. Dereske, *Miss Zukas Shelves the Evidence*, Avon, New York, 2001, p. 47)

— **The key:** A loud noise is a typical means of waking a sleeper; no intervening entity/event needed.

• The most productive way to think about the relation between the causing event and the result state: Is the action lexicalized by the verb a usual way to bring about the relevant result state? (Although there may be one-off exceptions.)

• This property of the relation between events seems to be the reason why the relation qualifies as tight enough to allow resultatives to be concealed causatives.

• This observation is the 'reverse' of previous observations that in both selected and nonselected NP resultatives, the adjective denotes a 'canonical' or 'normal' result state of the action lexicalized by the verb (Kaufmann & Wunderlich 1998:15, Wechsler 1997:310, (10)).

— These observations assume that in every resultative the action denoted by the verb has a 'canonical' result, but not all do: consider sound emission and bodily process verbs (e.g., *cough*).

— This limitation, which involves primarily intransitive verbs, may explain why Wechsler confined the observation to selected NP resultatives.

4 More on nonselected NP resultatives

• A priori the connection between the causing and caused events in nonselected NP resultatives might seem weaker than in selected NP resultatives.

- **The reason:** A nonselected postverbal NP is not a participant in the causing event in the strong sense that a selected postverbal NP is.
- Yet the causing and caused events meet the tightness condition in nonselected NP resultatives as these resultatives are amenable to a causative paraphrase.
- This section takes a first, broad look at the relation between the events focusing on the participants in the larger event, including understood, but unexpressed participants.
- The nature of this relation has received some attention in discussions of:
 - understood objects of the verb as participants in the causing event and
 - the place of the nonselected NP in the larger event.

4.1 Understood objects as unexpressed participants in the causing event

- By definition a selected postverbal NP can be the verb's object when it is outside the construction.
- Thus, a verb's transitivity plays into whether it can be found in a selected NP resultative:

(20) SELECTED NP RESULTATIVE CONSTRUCTION:

Necessarily found with transitive verbs:

- a. Last night, the dog **poked me awake** every hour to go outside. (G. Dunford, "Charity's for the Birds", *The Toronto Sun*, November 27, 1994, p. 6)
- b. The dog poked me.

(21) NONSELECTED NP RESULTATIVE CONSTRUCTION:

Found with intransitive verbs ...

- a. He had set an alarm, which rang at five thirty the following morning, **shrilling them both awake**. (R. Pilcher, *Voices in Summer*, St. Martin's, New York, 1984, p. 116)
- b. * The alarm shrilled them.

and with transitive verbs:

- c. "Before you go, **crank me flat**." (L.M. Roberts, *Almost Human*, Ballantine, New York, 1998, p. 17)
- d. * You cranked me.
- e. You cranked the hospital bed.

- When the verb in a nonselected NP resultative is transitive, its object although unexpressed, is still understood (Carrier & Randall 1993, Kaufmann & Wunderlich 1998, L&RH 1995)

(22) Audrey flipped a mug into the air, caught it by its handle, and **poured it full**. (L. Greenlaw, *Fisherman's Bend*, Hyperion, New York, 2008, p. 219)

(23) Audrey poured the coffee. [understood, but unexpressed participant in (22)]

- Such resultatives always involve manner verbs.

- As noted in Levin (1999) and RH&L (1998, 2010), two-argument manner verbs (unlike result verbs) need not express their non-subject—or non-effector (Van Valin & Wilkins 1997)—argument.
- This property is just the prerequisite needed to give rise to a nonselected NP resultative.
- Although these understood participants are ‘intermediate entities’ in the causal chain, the acceptability of these resultatives means that they do not count as ‘intervening’ or ‘intermediate causes’.
- Thus, they are like facilitating instruments, which also do not count as ‘intervening causes’ which could ‘disrupt’ the causal chain, i.e. lead to the ill-formedness of a concealed causative.
- **Ask:** What types of intermediate entity allow a tight relation between causing and caused events?
See Section 5

4.2 On the place of the nonselected NP in the larger event

- Although the postverbal NP is not selected by the verb describing the causing event, the entity it denotes is nevertheless said to be a participant in this event (Kaufmann & Wunderlich 1998:32).
— Jackendoff (1990:226–227): the postverbal NP bears an ‘oblique’ relation to the verb.
— Sato (1987:83): the postverbal NP bears a location or goal relation to the verb.

(24) Audrey poured coffee **into the mug**.

- However, the postverbal NP does not always bear such a clear relation to the causing event.
— Attempts to accommodate this NP may not capture the precise sense of the resultative.

(25) a. ... the roosters that scratch in the yard of Brastagi’s best hotel **crowed me awake** that dawn a few months ago ... (T. Robbins, “Treks for the Sophisticated Traveler”, Section 6, Part 2, *The New York Times*, March 16, 1986, p. 8)
b. ≠ The roosters crowed at me that dawn a few months ago.

— Or it may not be possible to accommodate the postverbal NP in a sentence with the verb.

(26) a. He had set an alarm, which rang at five thirty the following morning, **shrilling them both awake**. (R. Pilcher, *Voices in Summer*, St. Martin’s, 1984, p. 116)
b. ?? The alarm shrills at/to them.

— Or it may seem odd to call the referent of the postverbal NP a participant in the causing event.

(27) a. “Before you go, **crank me flat**.” (L.M. Roberts, *Almost Human*, Ballantine, New York, 1998, p. 17)
b. * You cranked me. (cf. You cranked the hospital bed.)

- **To summarize:** In some nonselected NP resultatives the entity denoted by the postverbal NP is a participant in the causing event in a weak sense, while in others it is not really a participant at all.

5 How does the causing event impinge on the holder of the result state?

Questions raised by nonselected NP resultatives:

- What is the nature of the relation between the postverbal NP and the larger event?
- How does the understood object of the verb, if there is one, relate to the postverbal NP?

This section: Examines specific relations represented in the corpus.

A term: The holder of the result state = the entity denoted by the postverbal NP.

5.1 Physical manipulation of the holder of the result state

Relevant states: A wide range of physical properties, including colors.

- (28) black, brown, gray, red, white, . . . ; bare, barkless, clean, clear, closed, dry, empty, flat, full, open, shut, smooth, taut, thin, . . .
- (29) Last night, the dog **poked me awake** every hour to go outside. (G. Dunford, “Charity’s for the Birds”, *The Toronto Sun*, November 27, 1994, p. 6)
- (30) The waitress comes back, **wiping the silverware dry** with a cloth napkin before laying it out. (M.G. Jaffe, *Dance Real Slow*, Farrar Straus Giroux, New York, 1996, p. 24)
- (31) Wetzon unpinned her hair, **brushed it smooth**, and redid it in the dancer’s knot. (A. Meyers, *Hedging*, Five Star, Waterville, ME, 2005, p. 327)
- (32) Amado, **tugging the cable taut**, grunted. (J. Spencer-Fleming, *I Shall Not Want*, St. Martin’s, New York, 2008, p. 88)
- (33) . . . **the planks of the table** were **scrubbed white** . . . (E. Peters, *The Dead Sea Cipher*, TOR Books, 1988, p. 43)

General description: Such result states in the entity denoted by the postverbal NP can be brought about by direct physical manipulation of this entity, perhaps using an instrument.

Relevant actions: A wide range of actions directed at a ‘force recipient’, including force exertion, hitting, and surface contact; the precise action depends on the nature of the result state.

- (34) a. FORCE EXERTION: jerk, nudge, pull, push, shove, tug, . . .
- b. HITTING: hammer, kick, poke, pound, pummel, slap, smack, . . .
- c. SURFACE CONTACT: blot, brush, dab, lick, pat, rub, scrape, scrub, wipe, . . .
- d. OTHER: bulldoze, choke, dye, nibble, rock, shake, shovel, spray, tie, stain, . . .

Resultative type — Selected NP: The entity denoted by the postverbal NP is understood to be the verb’s object—and, thus, a participant in the action lexicalized by the verb—as well as the holder of the result state.

Tightness: Such resultatives involve direct causation in the strongest sense: the holder of the result state is directly manipulated in the causing event. Any potential intermediate entities are facilitating instruments used in the causing event to effect the result state; these do not qualify as causers.

5.2 Action directed at stuff on a surface that is the holder of the result state

Relevant states: Certain states holding of surfaces: *bare, barkless, clean, clear, free* (=‘rid of’).

Surface: an entity conceived of as 2-dimensional.

- (35) ... **the outside land** which had been **eaten bare** by goats and horses ... (A.W. Upfield, *Sinister Stones*, 1954; Collier Books reprint, New York, 1986, p. 172)
- (36) Others require you to take an air shower that **blows you clean** in the vestibule. (S. Boxer, “Moving From Scruffy Quarters to a Limestone Labyrinth”, *The New York Times*, April 15, 2001, p. 18)

General description: Such result states in the entity denoted by the postverbal NP can be brought about by an action directed at stuff (often an impurity or obstruction) on the surface of this entity and thus, spatially contiguous to it.

Relevant actions: Various actions directed at stuff that causes its displacement; the precise action depends on what the stuff is.

- (37) blow, eat, rub, spoon, suck, ...

Understood causing event participant: The stuff on the entity denoted by the postverbal NP is the understood object of the verb lexicalizing the action (exception: *blow*, which is intransitive).

Resultative type — Nonselected NP: The entity denoted by the postverbal NP is not the object of the relevant verbs.

Tightness: Due to the spatial contiguity, as a consequence of the action on the stuff—its removal—the entity denoted by the postverbal NP ends up in the desired result state. From this perspective, there is no intervening entity or event.

Comparison: Contrast (35) to a selected NP resultative with the same postverbal NP and result:

- (38) The ice, in moving to the south, **scraped the land bare** of its overlying mantle of weathered rock. (Canadian Shield, *Encyclopaedia Britannica*)

— (38) is the type of resultative described in Section 5.1: the state in the entity denoted by the postverbal NP comes about through the exertion of force on this entity; as a side effect, stuff on this entity is removed from it.

— *scrape* contrasts with *eat*: The stuff can only be *scrape*’s object in the presence of a result XP: (38) or *scrape moss off the land*.

— In both (35) and (38) the stuff on the land is understood and could be expressed as an *of* complement to the adjective, but it is only understood as the object of the verb in (35).

5.3 Physical manipulation of contents of the container that is the holder of the result state

Relevant states: Certain states holding of containers: *empty, full, dry* (=‘empty’).

Container: an entity designed to contain something; must be 3-dimensional with an interior.

- (39) “I could **drink the whole punch bowl dry**.” (E. Richards, *A Truth for a Truth*, Berkley, New York, 2010, p. 206)
- (40) Tom wagged the bottle at me, and **swigged it empty** when I declined. (S.W. Boneham, *The Money Bird*, Midnight Ink, Woodbury, MN, 2013, p. 11)
- (41) I unloaded Bobby Lee and **poured his dish full of water**. (V. Lanier, *A Brace of Bloodhounds*, HarperCollins, New York, 1997, p. 184)

General description: Such result states in a container, denoted by the postverbal NP, can be brought about by actions directed at its contents rather than at the container itself.

Relevant actions: Various actions designed to (re)move stuff, often a liquid, perhaps with an appropriate instrument.

- (42) drain, drink, pour, pump, slurp. suck, swig, ...

Understood causing event participant: The stuff—i.e. the contents of the container named by the postverbal NP—is the understood object of the verb lexicalizing the action.

Resultative type — Nonselected NP: The container—the entity denoted by the postverbal NP—is not the object of the verb lexicalizing the action denoted in the causing event.

Tightness: Due to spatial contiguity between contents and container, removing the contents of a container proceeds in tandem with bringing about the desired result state in it; that is, states of a container can be altered by affecting its contents. From this perspective, there is no intervening entity or event.

Note: The container–contents relation is privileged conceptually, if not linguistically (Feist 2004, Levinson et al. 2003).

5.4 Physical manipulation of a container whose contents is the holder of the result state

This rather rare type of resultative is the ‘inverse’ of the type described in Section 5.3.

Relevant states: Various states that can come to hold of an entity contained in a second entity. It is not clear that this set constitutes a coherent class of states; instances appear to be one off.

- (43) “Before you go, **crank me flat**.” (L.M. Roberts, *Almost Human*, Ballantine, New York, 1998, p. 17)
- (44) ... a skinny little white woman was washing a huge pile of fresh mixed greens and **spinning them dry**. (M. Maron, *High Country Fall*, Mysterious Press, New York, 2004, p. 145)

General description: A result state of a contained entity is brought about by acting on its container.

Relevant actions: Various actions involving physical manipulation (e.g., *crank*, *spin*).

Understood causing event participant: The container, whose contents is the entity denoted by the postverbal NP, is the understood object of the verb lexicalizing the action.

Resultative type — Nonselected NP (as in Section 5.3): The entity denoted by the postverbal NP is not the object of the relevant verbs.

Tightness: Due to spatial contiguity, affecting the container affects its contents—the entity denoted by the postverbal NP—so it ends up in the desired result state. From this perspective, there is no intervening entity or event; if anything, the container falls under the notion ‘facilitating instrument’ broadly construed.

5.5 Physical manipulation of a barrier to the container that is the holder of the result state

Relevant states: Certain states holding of containers relating to the accessibility of their contents: *closed, open, shut*.

- (45) He walked back to the fence at the rear of the parking lot before **popping the can open** . . .
(J. Dawson, *A Credible Threat*, Fawcett Columbine, New York, 1996, p. 85)
- (46) He reached down to the black leather attaché case, lifted it on to his lap and **clicked it open**.
(P.D. James, *The Children of Men*, Knopf, New York, 1993, p. 124)

General description: Such a result state in the entity denoted by the postverbal NP—a container—can be brought about by acting on its lid or closure, which can prevent access to its contents.

Relevant actions: The actions used to gain access are of two types:

— Actions directed at a lid, seal, or comparable entity—that is, a part of a container that needs to be (re)moved to allow access to its contents.

— Actions directed at a closure, such as a lock or clasp, that holds parts of a container together, preventing access to its contents.

- (47) a. VERBS INVOLVING A LID INCLUDE: blow, flip, pop, . . .
b. VERBS INVOLVING A CLOSURE INCLUDE: bleep, click, tie, . . .

Understood causing event participant: The lid or closure of the entity whose contents needs to be (in)accessible is the understood object of the verb lexicalizing the action.

Resultative type — Nonselected NP: The entity denoted by the postverbal NP—the entity denoting the container which the lid or closure is part of—is not the object of the relevant verbs.

Tightness: As a result of the action on its lid or closure, the entity denoted by the postverbal NP ends up in the desired result state. Here the action involves a part of the entity that the result state holds of, so that manipulating this part has an effect on the state of the whole entity. From this perspective, there is no intervening entity or event.

Note: In contrast to resultatives with *bare, empty*, etc. (Sections 5.2 and 5.3), there is no morphosyntactic device permitting the verb’s unexpressed object to be expressed elsewhere in the sentence: *closed, open, shut* lack the counterpart of an *of* complement, which would allow this option.

5.6 Physical manipulation of an entity by the body part that is the holder of the result state

Relevant state: A state holding of a body part, *raw* (=‘abraded, chafed’), which usually comes about due to the friction that arises when the body part is moved back and forth against some entity.

- (48) ... the author had **rubbed her hands raw** while scrubbing the hems of her older sisters’ long dresses ... (M.M. Hill, *Death Books a Return*, Pemberley Press, Corona del Mar, CA, 2008, p. 238)

General description: This result state can be brought about because the body part is being used as a facilitating instrument to carry out an action, named by the verb, on another, often unnamed entity.

Relevant actions: Actions involving repeated surface contact with an entity that can be performed using a body part.

- (49) VERBS INCLUDE: bite, burn, floss, flay, lick, pluck, rub, scour, scrape, scrub, ...

Understood causing event participant: An entity physically manipulated using the causer’s body part is the understood object of the verb lexicalizing the action.

Resultative type — Nonselected NP: The body part is not the object of the verb, although it is an instrument used in performing the action the verb lexicalizes.

Comparison: A selected NP resultative with *raw*, where the action targets a body part:

- (50) The salt [in the ocean water] **rubbed their feet raw**. (L. Alvarez, “For Cubans in Miami, the Gulf to their Homeland Narrows”, *The New York Times*, December 21, 2014, p. 21)

Tightness: As a side effect of carrying out the action, the body part becomes abraded or chafed. From this perspective, there is no intervening entity or event.

5.7 Emission of a sound, speech, or other input that impinges on the holder of the result state

Relevant state: Wakefulness, a state holding only of animate entities: *awake*.

- (51) a. ... the roosters that scratch in the yard of Brastagi’s best hotel **crowed me awake** that dawn a few months ago ... (T. Robbins, “Treks for the Sophisticated Traveler”, Section 6, Part 2, *The New York Times*, March 16, 1986, p. 8)
- b. Half an hour later I had finished my day’s work, **shouted Howard awake**, and headed to my truck ... (S. Andrews, *Tensleep*, Penzler, New York, 1994, p. 143)
- (52) a. Even Charlotte had been unable to **stare her awake** as she usually did. (J. McGown, *Unlucky for Some*, Ballantine, New York, 2004, p. 203)
- b. My Bonamassa warning light has just **flashed me awake** ... (<http://theafterword.co.uk/eyes-wide-open-aynsley-lister/>)

General description: Wakefulness can be brought about by a noise, by speaking to the sleeper, or even by gazing or shining light at the sleeper.

Relevant actions: The actions involve the production of a sound, speech, light, or a gaze, and, concomitantly, attested are verbs of light or sound emission and manner of speaking.

(53) bark, crow, jangle, scream, shout, shrill, . . . ; flash, shine, stare, . . .

— Attested manner of speaking and sound emission verbs involve loud or high-pitched sounds, precisely the kinds of sounds most likely to wake someone.

— Few resultatives are attested with light emission verbs or *stare* probably because light is less effective than sound as a means of waking a sleeper.

— The attested verbs are typically considered intransitive, simply taking an emitter/speaker subject.

– However, in fact, many may take an object—often a cognate or reaction object—which denotes sounds, light, speech, or something comparable.

- (54) a. She screamed a high-pitched scream — they could probably hear it around the bend in the river. (S. Minot, *Folly*, Houghton Mifflin, Boston, 1992, p. 98)
- b. Kelly heard her Rottweiler Carl barking his “welcome home” bark in the backyard. (M. Sefton, *Skein of the Crime*, Berkley, New York, 2010, p. 4)
- c. As he parked, the sun emerged from behind a cloud and the pink stone glowed its welcome in the filtered spring sunshine . . . (S.B. Kelly, *Time of Hope*, Scribner’s, New York, 1992, p. 8)

Understood causing event participant: The emitted sound, speech, light, or gaze.

Resultative type — Nonselected NP: The sleeper is not the understood object of the verb lexicalizing the action.

Tightness: The sound waves, gaze, or light beam ‘move’ across space and make abstract ‘contact’ with the sleeper—the entity denoted by the postverbal NP—leading to wakefulness. Further, the emitted entity does not have its own energy source, so it does not qualify as an intervening cause.

6 Lessons from the survey of transitive resultative types

The major questions: How best to characterize the relation between the subevents so as to:

- encompass both selected and nonselected NP resultatives and
- shed light on why the postverbal NP is understood as selected or not.

Of particular interest: What can be learnt from nonselected NP resultatives since their causing and caused events meet the tightness condition governing the well-formedness of resultatives, although their postverbal NP is not selected by the verb representing the causing event.

6.1 Selected NP resultatives

- The result state in the entity denoted by the postverbal NP is one that a causer, perhaps using an instrument, brings about by acting directly on this entity, usually via physical manipulation.
- Concomitantly, verbs denoting actions involving surface contact with or force exertion on an entity are prevalent in selected NP resultatives, with the choice depending on the nature of the result state.
- There is no intermediate entity (except perhaps for a facilitating instrument) and, thus, no intervening cause (let alone, an intervening event) in selected NP resultatives.
- Thus, such resultatives satisfy the tightness condition in a way that falls under previously proposed direct causation conditions.

6.2 Nonselected NP resultatives

- The result state in the entity denoted by the postverbal NP is one that a causer, perhaps using an instrument, brings about by an action that impinges on, thus causing a change of state in, this entity.
- This impingement is mediated by an understood entity involved in the causing event:
 - The understood entity is spatially contiguous with the entity denoted by the postverbal NP, e.g., in a contents–container or part-whole relation to it.

(55) Having ... **drunk the teapot dry** ... (E. Dark, *Lantana Lane*, Virago, London, p. 94)

Due to spatial contiguity, when the causer acts on the understood entity the causer is also acting on the entity denoted by the postverbal NP.

The relevant actions typically involve physical manipulation of the understood entity, and, concomitantly, the verb denotes such an action.

— The understood entity is a force recipient with the postverbal NP denoting a body part used to perform an action on it.

(56) ... the author had **rubbed her hands raw** while scrubbing the hems of her older sisters' long dresses ... (M.M. Hill, *Death Books a Return*, Pemberley Press, Corona del Mar, CA, 2008, p. 238)

Due to contact between the causer's body part and the understood entity, when the causer acts on the understood entity, the causer is also acting on the body part.

The relevant actions typically involve physical manipulation of the understood entity, and, concomitantly, the verb denotes such an action.

— The understood entity is sound, speech, light, or a gaze.

(57) He had set an alarm, which rang at five thirty the following morning, **shrilling them both awake**. (R. Pilcher, *Voices in Summer*, St. Martin's, 1984, p. 116)

The understood entity moves into ‘contact’ with the entity denoted by the postverbal NP, impinging on it in an abstract sense and bringing about the result state.

The relevant actions typically involve production of sound, speech, light, or a gaze, and, concomitantly, the verbs denote substance, light, or sound emission, manner of speaking, or looking.

- In each instance, the understood entity does not constitute an intervening causer since it does not have any internal energy source of its own (Wolff et al. 2010).
- Thus, nonselected NP resultatives satisfy the tightness condition in a way that comes under previously proposed direct causation conditions.

7 Conclusions

- This study has explored the two types of transitive resultative constructions in order to shed light on the nature of the tightness condition on concealed causatives.
- It confirms that something like the notions of direct causation in the literature, including no-intervening-cause conditions, are important to the well-formedness of resultative constructions.
- Physical manipulation of participants—including via spatial contiguity—falls under tightness.
- More abstract relations that seem to generalize such notions matter too, like the abstract ‘contact’ relevant to some resultatives with the result AP *awake*.

Looking forward:

- This study focused on transitive resultatives whose result APs described physical states.
- Future work should explore whether, as expected, its conclusions extend to:
 - mental-state denoting result APs though other more abstract relations may be involved;
 - result PPs, which may denote physical or mental states.

Appendix: Attested transitive resultative subtypes

See Levin (2015, 2018) for more case studies and examples underlying these tables.

Table 1: Selected NP resultatives

Result AP	Postverbal NP	Action type	Example
<i>dry</i>	surface	surface contact	wipe the forks dry
<i>clean/clear/bare</i>	surface	surface contact	wipe the table clean
<i>empty/full</i>	container	exerting force/ingesting	shake the bag empty
<i>open/closed/shut</i>	container	exerting force/impact/rupturing	tear the bag open
<i>open/closed/shut</i>	portal/barrier	exerting force/caused manner of motion	push the door open
<i>flat/smooth/thin</i>	physical entity	exerting force/surface contact/	smash the grape flat
<i>free/loose</i>	attached entity	exerting force/body-internal motion	jerk the key free
<i>raw</i>	body part	surface contact	scrub fingers raw
<i>awake</i>	animate entity	exerting force/surface contact	jerk Tracy awake
<i>black/red/white</i>	physical entity	surface contact, painting . . .	rub her face red

Table 2: Nonselected NP resultatives

Result AP	Postverbal NP	Unexpressed entity	Action type	Example
<i>dry</i>	container	contents	manner of liquid removal sound/secretion emission	drink the teapot dry
<i>full/empty</i>	container	contents	manner of putting/ ingesting	pour the dish full
<i>clean</i>	body part	secretion	emission of secretion	spit one's mouth clean
<i>clean/clear/ bare</i>	surface	debris/stuff on surface	ingesting/surface contact	blow/eat the field bare
<i>open/shut/ closed</i>	container	lid/seal	action on lid/seal	pop the can open
<i>open/shut/ closed</i>	container	closure	action on closure/lock	click the case open
<i>flat/dry</i>	contents	container	action on container	crank someone flat/ spin the lettuce dry
<i>flat/thin/ smooth</i>	force recipient	body part/ instrument	surface contact	stomp the hat flat/ run the pavement thin/ roll XX flat
<i>free/loose</i>	attached entity	connection to anchor	force exertion/ surface contact	kick oneself free
<i>raw</i>	body part	force recipient	surface contact	scrub one's fingers raw
<i>awake</i>	recipient (perceiver)	sound/gaze	sound emission/ directing gaze/ bodily process	bark/snort/stare someone awake
<i>awake</i>	recipient (addressee)	sign/words	manner of speaking bodily process	cough/shout someone awake
<i>hoarse</i>	'subject'	sound/body part	manner of speaking/ bodily process	shout/cough oneself hoarse

References

- Bittner, M. (1998) "Concealed Causatives", *Natural Language Semantics* 7, 1-78.
- Carrier, J. and J.H. Randall (1993) "Lexical Mapping", in E. Reuland and W. Abraham, eds., *Knowledge and Language II: Lexical and Conceptual Structure*, Kluwer, Dordrecht, 119-142.
- Croft, W.A. (1991) *Syntactic Categories and Grammatical Relations*, University of Chicago Press.
- Dowty, D.R. (1979) *Word Meaning and Montague Grammar*, Reidel, Dordrecht.
- Feist, M.I. (2004) "Talking about Space: A Cross-linguistic Perspective", *Proceedings of the Twenty-Sixth Annual Conference of the Cognitive Science Society*.
- Fodor, J.A. (1970) "Three Reasons for Not Deriving *Kill* from *Cause to Die*", *Linguistic Inquiry* 1, 429-438.
- Goldberg, A.E. (1991) "It Can't Go Up the Chimney Down: Paths and the English Resultative", *BLS* 17, 368-378.
- Goldberg, A.E. (1995) *Constructions* University of Chicago Press, Chicago, IL.
- Grône, M. (2014) *Les résultatives de l'anglais: Une étude de leur syntaxe et de leur productivité à l'aune de la sémantique lexicale et de la pragmatique*, Doctoral dissertation, Paris 7.
- Hall [Partee], B. (1965) *Subject and Object in English*, Doctoral dissertation, MIT, Cambridge, MA.
- Hay, J., C. Kennedy, and B. Levin (1999) "Scalar Structure Underlies Telicity in 'Degree Achievements'", *Proceedings of SALT 9*, 127-144.
- Hoekstra, T. (1988) "Small Clause Results", *Lingua* 74, 101-139.
- Hoekstra, T. (1992) "Subjects Inside Out", *Revue Québécoise de Linguistique* 22, 45-75.

- Jackendoff, R.S. (1990) *Semantic Structures*, MIT Press, Cambridge, MA.
- Kaufmann, I. and D. Wunderlich (1998) “Cross-linguistic Patterns of Resultatives”, ms.
- Kratzer, A. (2005) “Building Resultatives”, in C. Maienborn and A. Wöllstein, eds., *Event Arguments: Foundations and Applications*, Niemeyer, Tübingen, 177-212.
- Levin, B. (1999) “Objecthood: An Event Structure Perspective”, *Proceedings of the 35th Annual Meeting of the Chicago Linguistic Society, Part 1: The Main Session*, 223-247.
- Levin, B. (2015) “The Puzzle of Nonselected NP Resultatives”, handout, Linguistics Colloquium, University of California, Berkeley.
- Levin, B. (2018) “Causation: The Perspective from Resultatives”, handout, Sinn und Bedeutung 23, Universitat Autònoma de Barcelona, Barcelona, Spain.
- Levin, B. and M. Rappaport Hovav (1991) “Wiping the Slate Clean: A Lexical Semantic Exploration”, *Cognition* 41, 123-151.
- Levin, B. and M. Rappaport Hovav (1995) *Unaccusativity*, MIT Press, Cambridge, MA.
- Levin, B. and M. Rappaport Hovav (1999) “Two Structures for Compositionally Derived Events”, *Proceedings of SALT 9*, 199-223.
- Levinson, S., S. Meira, and The Language and Cognition Group (2003) “‘Natural Concepts’ in the Spatial Topological Domain—Adpositional Meanings in Crosslinguistic Perspective: An Exercise in Semantic Typology”, *Language* 79, 485-516.
- Marantz, A.P. (1984) *On the Nature of Grammatical Relations*, MIT Press, Cambridge, MA.
- McCawley, J.D. (1978) “Conversational Implicature and the Lexicon”, in P. Cole, ed., *Syntax and Semantics 9: Pragmatics*, Academic Press, New York, 245-259.
- Neeleman, A. and H. van de Koot (2012) “The Linguistic Expression of Causation”, in M. Everaert, M. Marelj, and T. Siloni, eds., *The Theta System: Argument Structure at the Interface*, Oxford University Press, Oxford, UK, 20-51.
- Ono, N. (1992) “Instruments: A Case Study of the Interface between Syntax and Lexical Semantics”, *English Linguistics* 9, 196-222.
- Rappaport Hovav, M. and B. Levin (1998) “Building Verb Meanings”, in M. Butt and W. Geuder, eds., *The Projection of Arguments*, CSLI Publications, Stanford, CA, 97-134.
- Rappaport Hovav, M. and B. Levin (2001) “An Event Structure Account of English Resultatives”, *Language* 77, 766-797.
- Rappaport Hovav, M. and B. Levin (2010) “Reflections on Manner/Result Complementarity”, in M. Rappaport Hovav, E. Doron, and I. Sichel, eds., *Syntax, Lexical Semantics, and Event Structure*, Oxford University Press, Oxford, UK, 21-38.
- Sato, H. (1987) “Resultative Attributes and GB Principles”, *English Linguistics* 4, 91-106.
- Shibatani, M. (1976b) “The Grammar of Causative Constructions: A Conspectus”, in M. Shibatani, ed., *The Grammar of Causative Constructions*, Academic Press, New York, 1-40.
- Smith, C.S. (1970) “Jespersen’s ‘Move and Change’ Class and Causative Verbs in English”, in M.A. Jazayery, E.C. Polomé and W. Winter, eds., *Linguistic and Literary Studies in Honor of Archibald A. Hill, Vol. 2, Descriptive Linguistics*, Mouton, The Hague, 101-109.
- Talmy, L. (2000) *Towards a Cognitive Semantics I: Concept Structuring Systems*, MIT Press.
- Tenny, C.L. (1994) *Aspectual Roles and the Syntax-Semantics Interface*, Kluwer, Dordrecht.
- Van Valin, R.D. and D.P. Wilkins (1996) “The Case for ‘Effector’: Case Roles, Agents, and Agency Revisited”, in M. Shibatani and S.A. Thompson, eds., *Grammatical Constructions*, Clarendon Press, Oxford, UK, 289-322.
- Wechsler, S. (1997) “Resultative Predicates and Control”, *Texas Linguistic Forum 38: The Syntax and Semantics of Predication*, University of Texas, Austin, TX, 307-321.
- Wojcik, R. (1976) “Where Do Instrumental NPs Come From?” in M. Shibatani, ed., *Syntax and Semantics 6: The Grammar of Causative Constructions*, Academic Press, New York, 165-180.
- Wolff, P. (2003) “Direct Causation in the Linguistic Coding and Individuation of Causal Events”, *Cognition* 88, 1-48.
- Wolff, P., G. Jeon, B. Klettke, and Y. Li (2010) “Force Creation and Possible Causers across Languages”, in B. Malt and P. Wolff, eds., *Words and the Mind: How Words Capture Human Experience*, Oxford University Press, Oxford, UK, 93-111.