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Revealing implicit causes in passives, *-able* adjectives, *-tion* nominalizations and middles*

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By asking a question about nominalizations at my PhD defense, Tom effectively started our collaboration on argument and event structure in passive, *-able* adjectives and *-tion* nominalizations, which has resulted in several joint papers. It is this line of research that I am developing here in this squib, offering a novel set of data and raising questions for linguistic theory that I hope we will work out together.

1. Introduction

Causative verbs describe situations in which one event participant acts upon another participant, as a result of which the second participant undergoes a change of state. Typically, a causative verb combines with an agent participant, who is animate, acts with volition and intention and causes a change of state. But the participant instigating a change of state does not need to be an agent; a change of state can also come about as the result of a natural cause affecting a second participant. For example, an earthquake can damage a brick house, a hurricane can destroy a beach house and a sand storm can cover up a tent. While agents have been studied in much detail in linguistic theory, there is hardly any attention to the properties of natural causes as subjects of causative verbs (with a few recent exceptions: Copley & Martin 2014; Demirdache & Martin 2015; Schäfer 2012, and some earlier work Folli & Harley 2008).

I will compare Agent and natural Cause subjects in various constructions that involve a so-called implicit Agent, to see if they also allow an implicit Cause: passive, *-able* adjectives, *-tion* and *-ing* nominalizations, and middle constructions. After analyzing to what extent the syntactic properties of implicit Agents and Causes come out the same, I will discuss the consequences for interface theories between lexical semantics and syntax. Which features of lexical verb meaning—change of state, animacy, intentionality,

* The semantic judgments in this paper are often very subtle. They are based on one native speaker informant so far. I thank Jennifer Spenader for her judgments, discussion of the focus of this paper and very active contribution of better examples, which made her more aware of her own use of middles.

volition—carry over as the syntactic manifestation of implicit Agent and Cause arguments in syntax and derivational morphology?

2. Implicit Agents

Throughout his career, Tom Roeper has investigated in great detail the grammatical properties of Agents, both in syntax and in derivational morphology, contributing in a major way to present-day knowledge of Agents (Finer & Roeper, 1989; Keyser & Roeper, 1984; Roeper, 1987; Roeper & van Hout, 1999). Roeper revealed a so-called “implicit Agent” in different types of constructions. An implicit Agent is an inferred event participant: it plays a role in the action, but is not overtly expressed in the sentence. An implicit agent thus functions as an argument of the verb and is part of its lexical-semantic specification.²

Even though they are hidden, implicit Agents have a syntactic presence. The best-known case with an understood Agent are passives (Roeper 1987, henceforth R in the quotation of his original examples): (1a) is interpreted as someone doing the sinking. The Agent can be made explicit in a *by*-phrase, (1b).

- | | | | |
|-----|----|----------------------------|-------|
| (1) | a. | The ship was sunk. | R (1) |
| | b. | The ship was sunk by Bill. | R (2) |

Roeper shows that implicit Agents can also be detected in derivational morphology where they can also be expressed in an optional *by*-phrase: *-able* derivations, (2), *-tion* nominalizations, (3), and *-ing* nominals, (4).

- | | | |
|-----|--|---------|
| (2) | The grammar is learnable (by the child) | R (6) |
| (3) | the destruction of the city (by the enemy) | R (131) |
| (4) | the smelling of fish (by customers) | R (67) |

Implicit Agents are furthermore present in middle constructions (Keyser & Roeper 1984, henceforth K&R). Middles are derived from transitive verbs with an Agent and a Theme, (5a). In the middle construction the Theme argument appears in subject position, (5b). The Agent is unexpressed, but understood: middles can be paraphrased with an Agent, for example, “it is easy for someone to bribe bureaucrats”. In contrast to passives, the Agent is not expressible in a *by*-phrase in middles, (5c).

² I use the terms Agent and Cause with an initial capital when referring to a particular argument in a sentence with a causative verb, expressed as subject of a transitive verb, in a *by*-phrase in a passive or left implicit in other constructions. Since the notion of “thematic roles” does not figure anymore in modern-day versions of syntactic theory, I will call the phrases under investigation Agent and Cause “arguments”, but it should clear that this labeling is reminiscent of the notion of “thematic roles” in older varieties of the theory.

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- (5) a. Someone bribed the bureaucrats. K&R (3)
b. Bureaucrats bribe easily. K&R (3)
c. *Bureaucrats bribe easily by managers. K&R (75)

Middles are not to be confused with unaccusatives that are related to causative verbs in the causative-inchoative alternation. For example, transitive *sink* takes an Agent and a Theme and has a causative meaning, (6a), whereas the unaccusative variant of *sink* has just a single argument, a Theme, and expresses a change of state, (6b). Unaccusatives do not encode a sense of a cause or causation, so there is no second argument in addition to the Theme, not at a lexical level, nor in the syntax. Therefore, since unaccusatives do not have an implicit Agent, it cannot be expressed in a by-phrase.

- (6) a. The army sank the boat.
b. The boat sank. K&R (17)
c. *The ship sank by Bill. K&R (2)

Keyser and Roeper (1984) illustrate the presence of an implicit Agent in middles versus the agentlessness of unaccusatives with the contrast in (7): the compatibility of the phrase *all by itself* with the unaccusative in (7a) supports the claim there is no implicit Agent, in contrast to the middle in (7b), where the meaning of *all by themselves* is in conflict with the implicit Agent, hence the ungrammaticality.

- (7) a. The boat sank all by itself K&R (71)
b. *Bureaucrats bribe easily all by themselves.

Summarizing this brief overview of implicit Agents, passive, middle and unaccusative constructions all have one overt argument in subject position: the Theme. Passives and middles are alike because they have an implicit Agent and thus involve two arguments at some level of representation, in contrast to unaccusatives which only have one. On the other hand, middles are syntactically one-argument verbs, because, unlike passives, they do not allow the overt expression of the Agent in a by-phrase.

The goal of this squib is to find out if Cause arguments can also be hidden. By applying tests that Roeper proposed for implicit Agents, I will check if these are also compatible with implicit Causes. If not, Roeper was right to assign Agents their special status in the grammar. But if Causes can be implicit, at least in some constructions, we need to rethink Roeper's theory of implicit Agents. If there are indeed constructions with a hidden argument that can be interpreted as either an implicit Agent or an implicit Cause, it raises questions about the mapping from the lexicon to syntax. Specifically, which underlying lexical-semantic properties of verbs give rise to implicit arguments in syntax?

3. Implicit Causes, passives and by-phrases

Causative verbs include morphologically simple verbs such as *break, burn, close, cure, damage, destroy, draw, eliminate, erase, erode, extinguish*, and *open*, as well as particle verbs such as *blow out, break off, slam shut* and *wipe out*. The following examples illustrate how such verbs can take either an Agent, (8a)-(11a), or a Cause subject, (8b)-(11b).

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- (8) a. The woman in the bulldozer destroyed the beach house.
b. The hurricane destroyed the beach house.
- (9) a. The woman slammed the door shut.
b. The wind slammed the door shut.
- (10) a. The woman broke off a branch of the tree.
b. The storm broke off a branch of the tree.
- (11) a. The vandals burned the house.
b. The wildfires burned the house.

The Cause argument can be implied in passives, provided that the context is such that the event can be triggered by a natural cause. It can be expressed overtly in a by-phrase, (12).

- (12) a. It was the hurricane season. The house was destroyed (by the hurricane).
b. It was very windy. The door was slammed shut (by the wind).
c. It was very the storm season. The branch was broken off (by the storm).
d. It hadn't rained for many months. The house was burned (by the wildfire).

Note that these are really verbal passives rather than adjectival passives in which the participle merely describes a resulting state. The eventive nature of these passives comes out unambiguously when a progressive tense is used, (13).

- (13) The house was being destroyed by the hurricane; only a crazy person would have run inside to save his pictures.

The next question is to see if implicit Causes can also be present in morphological derivations, and if so, if they can be expressed with a by-phrase. Suffix *-able* has been called passive because it attaches to transitive verbs, deleting the Agent argument, so that the Theme appears as the subject of the *-able* derivation (Keyser & Roeper 1984). Like passives, *-able* allows an implicit Cause when the context is right, and it can indeed be expressed in a by-phrase, (14).

- (14) a. The island has hurricanes, snowstorms, wildfire and earthquakes. What type of buildings should be built there?
b. Well, brick houses are damageable by earthquakes, so wood is better. But wood houses are damageable by wildfires. So maybe clay houses? But clay houses are damageable by snow storms.

Similarly, *-tion* nominalizations can involve an implicit Cause, and it can explicit in a by-phrase, (15).

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- (15) a. The destruction of the beach houses (by the hurricane) didn't come as a surprise.
b. The erosion of the rocky coast (by the constant waves) created a superb coastline.
c. The extinction of the wildfires (by a huge rain storm) was long expected.

However, this does not seem to extend to *–ing* nominals: these cannot combine with an implicit Cause, either with or without a by-phrase, (16)

- (16) a. *The damaging of brick houses (by the earthquake) didn't come as a surprise.
b. *The blowing out of the birthday candles (by an unfortunate gust of wind) caused the child to cry.
c. *The drawing of lines in the sand on the beach (by the waves) creates everchanging views.

The conclusion is that passives are compatible with implicit Causes, thus extending the interpretation possibilities of inferred arguments beyond implicit Agents. This conclusion is furthermore supported by *–able* derivations and *–tion* nominalizations, which can also imply either an implicit Agent or an implicit Cause. Like Agents, Causes can be spelled out overtly in a by-phrase in these constructions. This pattern does not carry over to *–ing* nominals, however, which do not allow an implicit Cause. Even though *–tion* and *–ing* nominals behave alike to some extent with by-phrases and control constructions (Finer & Roeper 1989), the contrast in (15) versus (16) suggests that they are syntactically different. It raises the question what it is about *–ing* nominals that resists a Cause argument, even if a Cause subject can appear in a clause with a progressive verb (examples (8b)-(11b) above can all combine with progressive *–ing*). It seems that the *–ing* suffix in nominals imposes agentivity on the implicit argument, and this is incompatible with a Cause.

4. Implicit Causes and control

The strongest argument for implicit Agents are control constructions. Keyser and Roeper (1984) and Roeper (1987) employ purpose clauses with a PRO subject to reveal the implicit Agent in passives: the implicit Agent of the action described in the purpose clause must be the same event participant as the implicit Agent of the action described by the main verb. Thus, in (17a), the inferred Agent (e.g., managers) offered bribes because it was important for them to keep the bureaucrats happy, and in (17b) it is those people who caused the boat to sink who also collected the insurance money.

- (17) a. Bureaucrats were bribed to keep them happy. K&R (78)
b. The boat was sunk to collect the insurance. R (3)

Purpose clauses can also be used in passives and nominalizations to reveal the implicit Agent there (Roeper 1987, Finer & Roeper 1989): the destroyers wanted to prove a point, (18a), and the person who prepared the lectures wanted to prove a point, (18b).

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- (18) a. The destruction of the city to prove a point R (46)
b. The preparation of the lectures to prove a point R (51)

In the same way as purpose clauses do, adverbial clauses headed by *without* bring out an implicit Agent (Roeper 1987), (19).

- (19) a. The boat was sunk without firing a shot. R (3)
b. The game was played wearing no shoes. R (99)

Can implicit Causes control the subject of purpose and *without*-clauses? Purpose clauses are not suitable as a test for implicit Causes, because purpose implies intentionality, hence the controller needs to be an intentional Agent. *Without*-clauses, on the other hand, are relevant because they do not imply intentionality. Example (20) tests whether an implicit Cause can be the controller: (20a) sets up a context with hurricanes as implicit Cause. Can it control the subject of the *without*-clause in the passive in (20b) and in the *-tion*-nominalization in (20c)?

- (20) a. The house was destroyed in the hurricane season. No inhabitants were injured.
b. The house was destroyed without injuring any inhabitants.
c. The destruction of the house without injuring any inhabitants

Intended reading for b and c:

“The hurricane destroyed the house, and the hurricane did not injure any inhabitants.”

Example (20a) is fine as a sequence of two separate clauses without any control. When the passive in (20b) and the *-tion* nominalization in (20c) is combined with an adverbial control clause, both are indeed compatible with a reading on which a natural cause such as a hurricane causes the destruction and in that process no one got injured. However, it is hard to tell in these examples if it is the hurricane that did not injure anyone, or rather the destruction event itself.

The same question—if passives can have an implicit Cause that controls a *without*-clause—is tested below by comparing active sentences with an overt Cause subject controlling the subject of the *without*-clause in the a-sentences and their passive counterparts in the b-sentences. The question is whether or not an implicit Cause can be inferred in these passives that controls the adverbial clause.

- (21) a. The hurricane destroyed the house without even waking up any of the neighbors.
b. ??The house was destroyed without even waking up any of the neighbors.
c. The house was destroyed without much noise.
- (22) a. The waves erased the lines in the sand without leaving a trace.
b. ??The lines in the sand were erased without leaving a trace.
c. The lines in the sand were erased without a trace.

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- (23) a. An unfortunate gust of wind blew out the birthday candles without leaving a single one lit.
b. ?The birthday candles were blown out without leaving a single one lit.
c. The birthday candles were all blown out without exception.

It turns out that it is hard to construe the passives in (21b)-(23b) in this way: the b-examples are decidedly worse than the a-examples on a construal with an implicit Cause. Note that when the adverbial clause is replaced by a non-clausal *without*-adverbial though, it is perfectly fine to infer an implicit Cause, (21c)-(23c). The non-clausal adverbial in the c-examples effectively removes control, and only in these cases can an implicit Cause be inferred. The crucial difference seems to be the control dependence in the b-sentences versus absence of any control structure in the c-sentences.

The conclusion is that an implicit Cause cannot function as the controller in control constructions with a *without*-clause. Apparently, control constructions are incompatible with an implicit Cause. Control seems to require agentivity in the controlling argument.

5. Implicit Causes in middle constructions

An implicit Agent must be inferred in middles, even though it cannot be overtly expressed, (24a), and moreover, it cannot control the subject argument of a purpose clause, (24b).

- (24) a. *Bureaucrats bribe easily by managers. K&R (75)
b. *Bureaucrats bribe easily in order to keep them happy. K&R (78)

Can an implicit Cause be inferred in a middle? It is clear that it cannot be expressed in a middle, (a), but can (b) be interpreted with an implicit Cause, paraphrased as “It is easy for earthquakes to destroy cities”?

- (25) a. *Cities destroy easily by earthquakes. Roeper & van Hout (41)
b. Cities destroy easily.

In order to test this, we need causative verbs that do not have an unaccusative counterpart (such as *destroy, damage, draw, eliminate, extinguish*). The class of verbs that allow the causative-inchoative alternation such as *open, burn, close, blow up* (causative *John opened the window*; inchoative *The window opened*) cannot be used for testing middles, because it is hard to differentiate the inchoative and the middle interpretation for sentences with a Theme subject (*The window opens easily*). The difference is very subtle: on the inchoative reading there is no understood Agent and the Theme object undergoes a change of state all by itself. On the middle interpretation there is an implicit Agent who causes a change of state in the Theme. But since the Agent is not expressed, it may be hard to see there is another reading beyond the inchoative interpretation.

The verbs in (26)-(28) are causatives without an inchoative variant. The a-sentences set up a context with an explicitly mentioned Cause in a transitive clause. The question is if the middle construction in the b-examples can be construed with this Cause.

- (26) a. The island has hurricanes, snowstorms, wildfire and earthquakes. What kinds of houses are vulnerable on this island?
b. Well, beach houses damage readily in the hurricane season. Wooden houses damage easily in the wildfire season. And brick houses damage easily in earthquake areas.
- (27) a. On beaches you see that waves always draw patterns in wet sand, but not so often in dry sand.
b. Patterns draw easily in wet sand compared to dry sand.
- (28) a. Even loads of rain cannot extinguish all the burning roots and trees in a wildfire.
b. Burning roots and trees don't extinguish easily.

With the right context, middles are indeed possible with an implicit Cause in (26b)-(28b).³ So, like passives, middles form another construction, the implicit argument of which can be construed as either an Agent or a Cause.

6. Conclusions

The goal of this squib was to extend Tom Roeper's work on implicit Agents and find out if there are also implicit Causes, such as earthquakes, storms, wildfires and waves. I have applied several tests originally proposed for implicit Agents. The results can be summarized as follows, (29).

- (29) a. Implicit Causes can be inferred in passives, *-able* adjectives and *-tion* nominalizations; they can be expressed overtly in a by-phrase in these constructions.
b. Implicit Causes can also be inferred in middle constructions.
c. Implicit Causes cannot control adverbial clauses with a PRO subject.

The main conclusion is that the implicit argument in passives, *-able*, *-tion* and middles can be either an Agent or a Cause. It is understood as the event participant that is causing the change of state in the Theme, be it an agentive, animate and intentional person or a non-agentive, non-animate and non-intentional natural cause.

This suggests that an analysis of these constructions with a syntactically active, but unexpressed argument in terms of a lexical operation on a causative verb's thematic roles, (Agent, Theme), as proposed in the linguistic framework of the 80's, is too restricted, since it does not cover Cause arguments. In such traditional, thematic role analyses, one could

³ For some reason, this test does not give the same result with *destroy*: the middle in (ib) is ungrammatical. Apparently there are further lexical restrictions on middles and implicit Causes.

- (i) a. It is common knowledge that earthquakes can easily destroy brick buildings, but not wooden buildings.
b. *Brick buildings destroy easily in earthquake areas, whereas wooden buildings don't destroy so easily.

then list these verbs with two theta-grids in the lexicon, (Agent, Theme) and (Cause, Theme), and define passive and middle as lexical operations that can target both Agent and Cause arguments. But that would miss the generalization that passive and middle rearrange the arguments of causative verbs in a certain way, never mind their exact thematic label, Agent or Cause. Namely, in both operations the argument that causes a change of state is “hidden” and is not projected onto the syntactic structure, as a result of which the argument that undergoes the change of state is foregrounded and appears as subject. The hidden argument remains present nevertheless, since a causative subevent with an Agent or Cause participant is entailed in passives and middles. This stands in contrast to unaccusatives, which merely encode a change of state in the Theme argument, and for which there is no hidden presence of a causing subevent, nor any hidden Agent or Cause.

Thematic roles no longer play a role in theory and VP-shells introduce Agent arguments for causative verbs, and presumably also Cause arguments (Hale & Keyser 1993 and much subsequent work that follows their structural approach to the lexicon). Yet, the data presented above raise many questions about the mapping from lexical information to syntax, and beyond to inferences about hidden arguments. Can all causative verbs combine with Agent and Cause arguments, or is there a subset that selects only Agents (*arrest, murder, fold*)? What is the underlying lexical feature to which argument-changing operations such as passive, *–able, –tion* and middle are sensitive? Is it to do with event structure properties such as causing a change of state, or rather properties of the event participant itself: animacy, intentionality, volition? Finally, the control structures in (21)–(23) pose an intriguing puzzle: while it is possible for an overtly expressed Cause to control an adverbial clause, why is it impossible for implicit Causes?

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