Transitives with inchoative semantics

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1   Introduction

The English verb *change* is an example of a verb undergoing the causative alternation, illustrated in (1).

(1)   a.   The shapes of mankind will change. intransitive anticausative
        b.   Geneticists will change the shapes of mankind. transitive causative

A standard view on the causative alternation is that the transitive, causative verb has a more complex event structure than the intransitive, anticausative verb. On this view, the lexical-causative variant of the alternation is roughly analyzed as 'cause to V-intransitive' (Dowty 1979, Levin & Rappaport Hovav 1995), projecting two event variables, one for a CAUSE event, and the other for a BECOME (inchoative) event leading to some state satisfying the stative property lexicalized by the verb (Parsons 1990, Piñón 2001). The event structure of alternating change-of-state verbs is, thus, represented along the lines in (2).

(2)   a. $\text{verb}_{anticaus} \rightsquigarrow ...\lambda e.\exists s(...\text{become}(e,s)...)$
        b. $\text{verb}_{caus} \rightsquigarrow ...\lambda e\lambda e'.\exists s(...\text{cause}(e,e') \wedge \text{become}(e',s)...)$

For instance, Parsons (1990: chap.6) can be attributed the following analyses of *break* in its anticausative and its (agentive) causative variant.[1]

(3)   a. $x\,\text{break}_{anticaus} \rightsquigarrow \exists e[\text{theme}(e,x) \wedge \exists s[\text{be-broken}(s) \wedge \text{theme}(s,x) \wedge \text{become}(e,s)]]$
        b. $x\,\text{break}_{caus}\,y \rightsquigarrow \exists e[\text{agent}(e,x) \wedge \exists e'[\text{cause}(e,e') \wedge \text{theme}(e',y) \wedge$
                          $\exists s[\text{be-broken}(s) \wedge \text{theme}(s,x) \wedge \text{become}(e,s)]]]$

Other authors, however, such as Rapp & von Stechow (1999), Kratzer (2005) or Alexiadou et al. (2015) argue that change-of-state verbs have the same event semantics in their transitive and intransitive uses: both denote a set of events yielding some state satisfying the predicate of state

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[1] We follow in (3) the reconstruction of Parsons' analysis of the two variants of change-of-state verbs proposed in Piñón (2001: 361). As noted in Piñón (1999: 430), while Parsons (1990: 119–120) (hesitantly) represents result states via the BECOME relation between events and states, he never actually says that verbs denoting events with a result state should be analyzed as having a result state argument, even it if is possible to understand him as endorsing this view. But he clearly endorses the view that the event structure is more complex for the causative than the anticausative variant, which is the main point of interest here.

lexicalized by the verb.[2] For example, Alexiadou et al. (2015) propose that causatives and anti-causatives involve the same verbalizing v-head taking a RootP introducing the internal argument DP as its complement, see (4). In both structures in (4), this v-head introduces a causative event leading to the state property expressed by the root and predicated over the internal argument. Lexical causatives and anticausatives, thus, do not differ in their event decomposition. Rather, the causative alternation is, for these authors, a Voice alternation: Voice, the syntactic head responsible for introducing external arguments (Kratzer 1996), is projected in causative (transitive) construals, and absent from anticausative (intransitive/unaccusative) construals. The Voice-head does not, itself, introduce any event, but relates a DP in its specifier to the event denoted by the vP in its complement position, in (4b) as the agent of this vP-event.

(4)   *The glass broke/Cecile broke the glass*
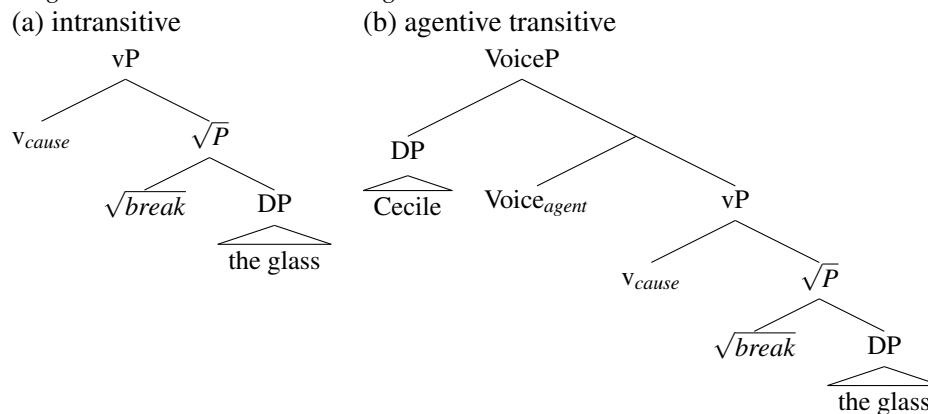
In this paper, we provide a fresh look at the event decomposition of verbs of change-of-state undergoing the causative alternation by addressing two related questions:

(5)   In sentences built with alternating change-of-state verbs,

   a.   what kind of events are described by the vP: causing events, inchoative events (changes), or both, i.e., full causation events?
   b.   Does this vary with the presence of VoiceP and the nature of the external argument introduced by Voice?

We will answer affirmatively to the second question; our proposal will be that except when the external argument is an agent, the vP of sentences built with a change-of-state verb tends to be used to describe *just a change* – that is, to have inchoative semantics. When the vP of a transitive sentence built with a change-of-state verb has inchoative semantics, the causing event is either denoted by the external argument, or it is left implicit. By contrast, when the external argument is an agent, the vP is used to describe a full causation event (a causing event and the ensuing change of the theme), and the subject DP denotes the agent of this causation event.

   The paper is organized as follows. Section 2 critically discusses different views on the event structure of change-of-state verbs, and introduces our research questions and main hypotheses. Section 3 focuses on the semantic and pragmatic differences between agent vs. causer subjects. Section 3.1 provides a brief background on the Voice framework adopted here and a semantics for the agent vs. causer Voice heads. Section 3.2 focuses on inanimate subjects, and section 3.3 on animate subjects. Section 4 shows how causative statements are interpreted differently in the context of an in-control agent than in all other cases, including out-of-control agency. Section 5

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[2] We leave aside alternating verbs which do not encode a result state but rather a result event, like causative verbs *bounce, rock, fly, roll, spin*, etc (see Levin & Rappaport Hovav 1995 among others).

turns to so-called transitive anticausatives (as in *The room changed its temperature*), as a further instance of transitive verbs with inchoative semantics. Section 6 concludes.

2   The event structure of change-of-state verbs

One of the main arguments to refrain from assuming, along the line of Parsons (1990) and others, an additional subevent for the agentive transitive variant compared to the intransitive anticausative variant of alternating verbs is that this assumption predicts separate modification for the agentive subevent (the action) and the inchoative subevent (the change) to be possible (Fodor 1970, Rapp & von Stechow 1999, Higginbotham et al. 2000, Pylkkänen 2008, Alexiadou et al. 2015 a.o). But separate modification is not possible, as illustrated by the contrast in (6) (see Fodor 1970: 433 for similar examples, and Higginbotham et al. 2000, Pylkkänen 2008, Martin & Schäfer 2014 for related examples involving manner modifiers, which point to the same conclusion). The sentences in (6b/c) are not felicitous in the relevant context set up in (6a) where Godzilla did not do anything else to Aldous than pushing her out of the window on Sunday. In this scenario, the agentive *kill*-subevent (the pushing) takes place on Sunday, and the inchoative *kill*-subevent (the dying) takes place on Tuesday night. This scenario cannot be lexicalized with the verb *kill* if both subevents are modified separately.

(6) a. Godzilla pushed Aldous out of the window **on Sunday**, and she eventually died **on Tuesday night**.
   b. #Godzilla pushed Aldous out of the window **on Sunday** and she fell from the third floor. He ended up killing her **on Tuesday night**.
   c. #Godzilla killed Aldous **on Sunday** and she eventually died **on Tuesday night**.

The problem of (6b/c) results from the attempt of modifying two subevents separately. This requires the verb *kill* to have two different event arguments, which it does not have according to the authors mentioned above. The problem of (6b/c) is *not* due to the inability of lexical causatives to lexicalize a scenario as above, or more generally to express indirect causation, that is, causation between two spatiotemporally disjoint events. As noted for instance by Danlos (2000), as long as there is no attempt to modify the action and change sub-events separately, a lexical causative like *kill* is perfectly fine as a description of a causation event such that the agentive component and the inchoative component are spatiotemporally disjoint. This is shown in example (7), which is inspired by a similar example in Danlos (2000) (see also Neeleman & Van de Koot 2012, Martin 2018 for arguments in favour of the idea that lexical causative verbs can convey indirect causation).

(7) Godzilla killed Aldous. He pushed her out of the window **on Sunday** and she died **on Tuesday night**.

Research sharing the assumption that change-of-state verbs have a single event argument across intransitive and transitive uses typically assumes that the nature of the relation between the event and the state is specified by the predicate itself. Under this view, change-of-state verbs encode the same relation between the event and the state across transitive and intransitive uses.[3] A first view is that events described by a change-of-state verb are BECOME events. So for instance, for Rapp & von Stechow (1999), change-of-state verbs are decomposed into v-BECOME and a state

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[3] But see Marantz (2013) and Wood & Marantz (2017) for an account where lexical causatives and anticausatives involve the same single eventive v-head which is, however, subject to contextually determined allosemy such that it is interpreted as CAUSE in the context of Voice introducing an external argument and as BECOME in the absence of such Voice. This proposal does not yet cover differences discussed below between in-control agents and other external arguments also introduced by Voice such as causers.

predicate across transitive and intransitive uses, and the agentive transitive use involves, on top, Voice introducing the agent of this BECOME-event, as illustrated in (8)-(9).

(8) a. The door opened.
     b. [v_{BECOME} [the door OPEN]]

(9) a. Ali opened the door.
     b. [Ali [VOICE [v_{BECOME} [the door OPEN]]]]

A problem for this view is that under the agentive transitive use, the vP-event sometimes starts when the action of the subject's referent starts, not when the change starts. This is unexpected if the vP-event is just the change. This is particularly obvious in progressive sentences. Take for instance (10):

(10) Ali Baba is opening the cave door (right now).

Let us imagine that Ali Baba knows a long magic formula that, once recited, causes the opening of the cave door. In that context, (10) is true as soon as Ali Baba begins reciting this formula. In the context of an in-control agent, the opening event can therefore start before the door has started to open. The same observation holds for languages like French that do not have a futurate reading for the progressive (Martin 2015), and therefore cannot be explained away by the futurate use of the progressive in English (on such readings of the English progressive, see Dowty 1977, Copley 2014 among others).[4]

   A second view is that change-of-state verbs invariably denote a set of CAUSE events. For instance, Alexiadou et al. (2015) decompose change-of-state verbs into v-CAUSE and a state predicate across intransitive and transitive readings. Adding Voice to the structure of the anticausative yields the transitive use, as shown in (11) and (12).

(11) a. The door opened.
      b. [v_{CAUSE} [the door OPEN]]

(12) a. Ali opened the door.
      b. [Ali [VOICE [v_{CAUSE} [the door OPEN]]]]

This solves the previous problem since the causing event plausibly contains the action of the agent when there is one. More concretely, Alexiadou et al. (2015) can say that in (10), the causing event is already in progress when Ali Baba is reciting the magic formula. But it is the analysis of the anticausative variant which turns out to run into problems. For Alexiadou et al. (2015), anticausatives are not descriptions of inchoative events, but of causing events (cf. Kratzer 2005), just like when used transitively. The way they analyse causer-PPs such as English *from*-PPs as in (13b) makes this particularly clear. Building on Solstad (2009), they assume that the *from*-PP introduces an event that gets identified with the vP-event of the anticausative. They assume the same for causer subjects as in (13a) (following Pylkkänen 2008). Thus for them, the event introduced by the causer DP or PP gets identified with the vP-event in (13a, b).

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[4] So for instance, as an anonymous reviewer observes, in a situation where two people *A* and *B* are walking up to the starting line of a race, *A* can ask *B*: *Are you running?*, and *B* can answer affirmatively, even though *B* is walking at the time. By contrast, a French-speaking person *B* could not felicitously reply *Oui* to the progressive question *Est-ce que tu es en train de courir?* 'Are you running' in the same context. For us, this cross-linguistic contrast is due to the fact that the progressive has a futurate reading in English but not in French (cf. Bertinetto 2000: p. 588) But French *Ali Baba est en train d'ouvrir la porte* 'Ali Baba is opening the door' is completely fine in a context where Ali Baba just started reciting a long magic formula and the door has not started to open yet. Since the French progressive requires an event satisfying the vP to be ongoing in all its uses, this confirms our point that events in the denotation of causative vPs can start before the change proper starts when these events involve an in-control agent. This is unexpected under the view that change-of-state verbs denote BECOME-events across uses, as in Rapp & von Stechow's (1999) analysis.

(13) a. The wind opened the window.
      b. The window opened from the wind.

A problem with this view is that separate modification shows that the event introduced by the causer is different from the vP-event. This is observed in Martin (2018; 2020) for causer subjects, see e.g. (15):[5]

(15) a. **Today**'s consumption of fossil fuels will change the shapes of mankind **tomorrow**.
      b. Aldous fell **on Sunday** from the third floor. After much agony and medical attempts to save her the fall ended up killing her **on Tuesday night**.
      c. The snow melt **on Sunday** eventually flooded the valley **on Thursday**.

(M. Rappaport Hovav, p.c.)

The same observation extends to anticausatives modified by PPs introducing causers:

(16) a. **Tomorrow**, the shapes of mankind will change from today's **consumption** of fossil fuels.
      b. **On Tuesday night**, Aldous died from **Sunday**'s fall.
      c. **On Thursday**, the valley flooded from the snow melt **on Sunday**.

Martin (2020) concludes from examples as in (15) that the event denoted by an external argument causer DP *causes* the vP-event rather than being identified with it (i.e., in (13a), the wind *causes* the door-opening event). Data as in (16) point to the same conclusion for anticausatives combining with causer PPs. Martin (2020) further argues that in non-agentive causative statements (as in (13)-(16)), the vP-event is the inchoative (BECOME) event yielded by the event denoted by the causer DP. An argument for this view is that in a non-agentive transitive statement, the vP-event necessarily starts when the change starts, and not before as in agentive causative statements, as we just observed through the Ali Baba example above. For instance, for (17) to be true, the door must start to open. The *cause* of this change is not part of the vP-denotation; rather, it is referred to by the subject (we come back to this point in section 4).

(17) The wind is (now) opening the door.

The same point is illustrated by the contrast (18), where the context denies the existence of an ongoing change. A progressive agentive causative statement can be true in a context where no change takes place because the vP-event can have a part preceding the change, which can be output by PROG (recall Ali Baba's example). But a progressive non-agentive causative statement cannot be true in such a context; since the vP-event *is* the change, any part of this event is also a part of the change.[6]

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[5] One of Martin's (2018) examples is as follows:

(14) Aldous stabbed Fido **on Saturday**. After much agony, the stabbing eventually killed Fido **on Sunday.**

However, as an anonymous reviewer also observes, the NP *the stabbing* is problematic in this example. We believe it is because such nominals, derived from manner verbs, describe an event necessarily involving an agent. But we are unsure at this point why separate modification is less easy with nominals derived from manner verbs than with nominals derived from result verbs as in our examples in (15a-c), and leave this point for further research.

[6] An anonymous reviewer finds example (18a) as well as example (58) below very tenuous, and claims that the verb *try* has to be added for such examples to be felicitous in the relevant context. While we have to leave an experimental assessment of this inter-speaker variation for future research, we would like to note that the fact that examples such as (18a) and (58) are accepted by a *proper* subset of native speakers of English actually speaks in favour of a pragmatic account as the one proposed here, where this variation is rooted back in a difference in the way speakers *use* causative

(18)   a.   I'm waking Ana up – I've shaken her twice! but she's dead to the world– she hasn't
              even begun to flutter her eyes yet.
        b.   The noise of the dishwasher is waking Ana up, #but she's dead to the world– she hasn't
              even begun to flutter her eyes yet.   (Harley & Folli 2023, adapted from Martin 2015)

Martin's (2020) idea that in a non-agentive causative statement as in (18b) the vP-event is the
BECOME-event is, in fact, exactly the proposal of Rapp & von Stechow (1999) discussed above.
However, Rapp & von Stechow (1999) assume this to hold for transitive causatives in general. We
are then back to the problem raised for Rapp & von Stechow's (1999) approach by the progressive
agentive sentences (10) or (18a), namely, the vP-event cannot be just a BECOME-event in an *agen-
tive* transitive use of a change-of-state verb. Clearly, the vP-event is not identified in the same way
in agentive and non-agentive statements. How to account for this difference in the semantics?

The solution to this problem explored in this paper is to give up the assumption that one must
choose to define the relation between the event and the state described by change-of-state verbs
either via BECOME or CAUSE.[7] This is the strategy we adopt here: in the semantics, we define
the relation between the event and the state not via BECOME or CAUSE, but via Kamp & Reyle's
(1993) temporal 'abut' relation. We analyse change-of-state verbs as denoting events e such that
e temporally abuts a state s satisfying the state property lexicalized by the verb, as shown in (19),
where $\bowtie$ stands for 'temporally abut'. The 'abut' relation requires s to start at the moment the
event e ends.

(19)   open $\rightsquigarrow \lambda e. \exists s (e \bowtie s \wedge \mathsf{open}(s))$

We therefore adopt the event decomposition in (20)-(22), where we embrace Martin's (2020) pro-
posal that a causer DP describes an event that causes the vP-event, while an agent DP denotes an
entity that stands in the thematic agent-relation with the vP-event. (We will define Voice$_{\mathrm{AGENT}}$ and
Voice$_{\mathrm{CAUSE}}$ introducing agents and causers, respectively, in section 3.) We thereby predict separate
modification for the action and the change not to be possible when the subject is an agent as in
(21a), since we only have one event in the corresponding (21b) (cf. the data in (6b, c)). But we also
predict separate modification to be possible when the subject is a causer as in (22a); in the corre-
sponding (22b), the vP still projects one event variable only, but now the causer DP introduces an
event which is distinct from the vP-event (cf. the data in (15a-c)).

(20)   a.   The door opened.
        b.   [v$_{\mathrm{EVENT}}$ [the door OPEN]]

(21)   a.   Ali opened the door.
        b.   [Ali$_{\mathrm{ENTITY}}$ [Voice$_{\mathrm{AGENT}}$ [v$_{\mathrm{EVENT}}$ [the door OPEN]]]]

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verbs in context (and we offer in section 4 an account for why in-control agents facilitate a use which is harder to obtain
in the absence of a 'normal' agent). A semantic account according to which speakers have a different *meaning* for
causative verbs seems much less attractive to us. Secondly, the fact that some speakers do not fully accept examples like
(18a) and (58) does not contradict our main point that such 'zero-change' readings are much worse when the subject is
not an in-control agent. Thirdly, we note that the *try*-variant of examples such as (18a) (*I'm trying to wake up Ana*) does
not fulfill the same communicative intention as the statements without *try*, since the use of *try to P* by default triggers
the inference that the attempt is not successful (Karttunen 1971). The speaker who aims to convey their optimism about
the ultimate outcome of their attempt might therefore have good reasons to avoid the use of *try*, while still using the
sort of discursive continuations we have in (18a) to admit with honesty that the attempt has not been not successful *yet*.
[7] Another solution to this problem is to give up the assumption that BECOME picks up fundamentally different events
than CAUSE, and consider that changes preceding a new state are in some sense (proximate) causes of this state. This is
the path taken in Martin (2020), who adopts Alexiadou et al.'s (2015) view that change-of-state verbs always denote a
set of CAUSE events. To this, she adds the proposal that CAUSE picks up inchoative (BECOME) events in the context of
an anticausative or non-agentive causative statement.

(22) a. The wind opened the door.
    b. [The wind$_{\text{EVENT}}$ [Voice$_{\text{CAUSE}}$ [v$_{\text{EVENT}}$ [the door OPEN]]]]

The next step is to develop an account predicting in which contexts the event temporally abutting the state s tends to be identified as a BECOME-event or as a full CAUSATION-event, which includes a BECOME-event (the mere change) as well as the corresponding CAUSE-event. As we just have seen, this is important to account for the interpretation of progressive sentences, for instance. This leads to the following question:

(23) What event (or slice of reality) does a vP built with a change-of-state verb refer to?

We aim to show that this largely depends on the external argument. In particular, we put forward the hypothesis in (24):

(24) INCHOATIVE HYPOTHESIS: Change-of-state verbs tend to be used and understood as descriptions of a mere change, except in the context of an agent, in the presence of which change-of-state verbs can easily be used to describe a full causation event (that is, a combination of cause and effect).

In other words, the idea is that a vP built with a change-of-state verb is typically used to describe just BECOME-events, and not combinations of cause and effect, *except* in the context of an agentive subject. In the latter context, the vP-event regularly also includes the action performed by the subject's referent, which causes the change. So for instance, in (25a) below, the (killing) vP-event can be 'stretched to the left' so as to describe a full causation event including cause and effect (Godzilla's pushing of Aldous and the ensuing dying event), see (25b) (we still deal with a *single* event argument in the semantics; simply, the event is made of an action and the related change in the ontology). But in (26a), the (killing) vP-event is identified as the dying (BECOME) event, see (26b), and the event causing this change is denoted by the subject DP.

(25) a. Godzilla killed Aldous. He pushed her out of the window on Sunday and she died on Tuesday night.
    b. [Godzilla$_{\text{ENTITY}}$ [Voice$_{\text{AGENT}}$ [v$_{\text{EVENT/CAUSATION}}$ [Aldous DEAD]]]]

(26) a. Aldous fell out of the window on Sunday. After much agony and attempts to save her, the fall eventually killed her on Tuesday night.
    b. [The fall$_{\text{EVENT}}$ [Voice$_{\text{CAUSE}}$ [v$_{\text{EVENT/BECOME}}$ [Aldous DEAD]]]]

For us, Rapp & von Stechow (1999) are therefore right on the view that transitive change-of-state verbs can describe BECOME-events (mere changes). We believe that this is exactly what happens, except in the case of agents, in the context of which vPs of change-of-state verbs are used to describe full causation events.

The hypothesis in (24) is of a *pragmatic* rather than *semantic* nature. It does not say that causatives have a different event structure with agents and non-agents. In the semantics, such causative statements are simply characterized by the abut-relation (cf. (19)). The hypothesis in (24) is a generalization about the way causatives are used in context: we tend to use causative vPs to describe events of different sizes depending on whether the subject is an agent or not. More precisely, in the presence of an agent, the relation between the event and the state tends to be interpreted as CAUSE, and as BECOME in other contexts. The subscripts EVENT/CAUSATION and EVENT/BECOME in (25b) and (26b), thus, translate a pragmatic enrichment of the causative statement in its literal meaning.

Support for the inchoative hypothesis will come from four kinds of evidence: (a) whether the occurrence of a change-of-state is entailed by the transitive progressive form of the vP (see the

contrast in (18a/b)), (b) whether the occurrence of a change is entailed by a transitive change-of-state verb in the complement of *begin/start*, (c) whether an *in*-adverbial measures the interval of the change or of a larger event and (d) whether the transitive statement presupposes the occurrence of an event involving the subject's referent, and causing the vP-event. These empirical arguments will be developed in Section 4.

To explore question (23) (which kind of events are described by change-of-state verbs across uses), we break with the habit of contrasting the anticausative with the agentive causative only and take into consideration a broader range of uses of alternating verbs, illustrated in (27), including what Schäfer (forthcoming) calls *transitive anticausatives*, illustrated in (27d). We also not only consider the typical case of in-control animate agents, but also look at instrumental and non-instrumental inanimate agents and out-of-control (accidental/inadvertent) animate agents.

(27)   a.   Geneticists will change the shapes of mankind.   agentive causative
        b.   Today's consumption of fossil fuels will change the shapes of mankind tomorrow.
                                                      non-agentive causative
        c.   The shapes of mankind will change tomorrow.   intransitive anticausative
        d.   Mankind will change its shapes tomorrow.   transitive anticausative

Our proposal will be that sentences such as (27b/d) exhibit a syntax/semantics mismatch: they are syntactically transitive, but the vP receives the same interpretation as in intransitive, i.e., inchoative, construals illustrated in (27c). That is, they form *transitive vPs with inchoative semantics*.

We turn next to the semantic and pragmatic differences between change-of-state sentences built with an agent and a causer subject.

3   Agent vs. causer subjects

We couch our analysis in the Voice framework originating in Kratzer (1996). Following Alexiadou et al. (2006), Schäfer (2008), Alexiadou et al. (2015), and Schäfer (forthcoming), we distinguish three different Voice heads: agent Voice, causer Voice and expletive Voice (we concentrate on active versions of these Voice heads; passivized or non-active versions of these heads are possible, too; cf. Bruening 2013; Alexiadou et al. 2015; Schäfer 2017; Schäfer forthcoming). We define the first two in the next subsections, and address expletive Voice in section 5, devoted to transitive anticausatives.
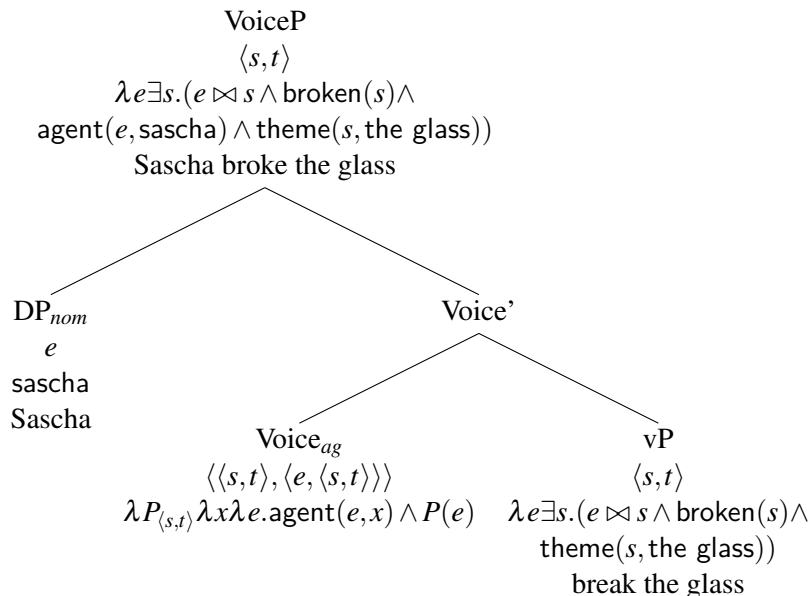
3.1   The semantics of agent and causer Voice

Agent Voice (henceforth Voice$_{ag}$) associates the thematic role 'agent' with the DP merged in its specifier. All kinds of agents (exerting agent control on their behaviour or not, acting intentionally or not) are introduced by the same Voice$_{ag}$. As shown in (28) and (29), we analyze Voice$_{ag}$ as taking two arguments (cf. Bruening 2013), first a function of type $\langle s,t \rangle$ denoted by the vP (*s* being the type for events among others), and second a DP external argument. We add the assumption that in order for a DP to be associated with the role of agent, it must denote an individual (as opposed to an eventuality), and therefore be of type *e*. The semantics of agent Voice in (28) will be enriched in section 3.2.1. A sentence like (29a) then has the the derivation in (29b).

(28)   Voice$_{ag}$ ⇝ $\lambda P_{\langle s,t \rangle} \lambda x_{\langle e \rangle} \lambda e_{\langle s \rangle}.\text{agent}(e,x) \wedge P(e)$ $\langle \langle s,t \rangle, \langle e, \langle s,t \rangle \rangle \rangle$
                                                                                    (to be revised)

(29) a. Sascha broke the glass

b.

$$\text{VoiceP}$$
$$\langle s,t\rangle$$
$$\lambda e\exists s.(e\bowtie s\wedge\text{broken}(s)\wedge$$
$$\text{agent}(e,\text{sascha})\wedge\text{theme}(s,\text{the glass}))$$
Sascha broke the glass

DP$_{nom}$
e
sascha
Sascha

Voice'

Voice$_{ag}$
$$\langle\langle s,t\rangle,\langle e,\langle s,t\rangle\rangle\rangle$$
$$\lambda P_{\langle s,t\rangle}\lambda x\lambda e.\text{agent}(e,x)\wedge P(e)$$

vP
$$\langle s,t\rangle$$
$$\lambda e\exists s.(e\bowtie s\wedge\text{broken}(s)\wedge$$
$$\text{theme}(s,\text{the glass}))$$
break the glass

Causer subjects are introduced by *causer Voice* (henceforth Voice$_c$). We take causer Voice to introduce an eventuality or a fact and to state that this eventuality/fact is causally responsible for the vP-event (see section 3.2). That is, Voice$_c$ introduces cause-semantics, and in the specifier of Voice$_c$, we find either eventualities-denoting DPs, as in (27b), or fact-denoting DPs, as in (30).

(30) The fact that we are over-consuming fossil fuels will change the shapes of mankind tomorrow.

Fact-denoting DPs are virtually never addressed in the Voice framework, but are regularly found in the subject position of some change-of-state verbs such as *cause* (Vendler 1967; see also Rose et al. 2021 on subject DPs denoting omissions such as in *The lack of sunscream caused Jane's skin to burn*), *kill*, or *change* (Martin et al. 2023, see section 3.1.1). However, treating facts as causer subjects requires some revisions of the semantics of causer Voice (i.e., Voice$_c$). For Pylkkänen (2008) and Alexiadou et al. (2015), Voice$_c$ has an event-denoting DP in its specifier. This event e is for them identified with the vP-event e', see (31) (Voice is combined with a vP via Event Identification, as in Kratzer 1996). So for instance for these authors, in *The tornado destroyed the city*, the tornado ends up being identified with the causing event in the denotation of the vP.

(31) $Voice_c \rightsquigarrow \lambda e\lambda e'.e=e'$ (Alexiadou et al. 2015)

Our first modification concerns then the ontological type of causer subjects. We take eventualities and facts to be of type s, and use the variable i as ranging in the domain of situations, which is the union of the set of eventualities e, facts f and other states of affairs. As our second modification, and following Martin et al. (2023), we depart from Pylkkänen's (2008) and Alexiadou et al.'s (2015) view according to which the eventuality e (or, we add, fact f) introduced in the specifier of Voice$_c$ is identified with the vP-event. A first problem for this view is that when the causer subject denotes a fact, this fact cannot be identified with the vP-event. For instance in (32), the killing *event* cannot be the *fact* denoted by the subject. A fact cannot be identified with an event; e.g., the fact that my plants lack water is a different entity than the killing-my-plants event. Furthermore, a fact cannot be a *participant* of an event.

(32)   The fact that my neighbours didn't water my plants killed them.   (Martin et al. 2023)

A second problem for such a view is that as already mentioned in the introduction, it predicts separate temporal modification for the event denoted by the causer subject and the vP-event not to be possible, *contra* the facts, as shown in (15a-c) repeated below (Martin 2020):

(15)   a.   **Today**'s consumption of fossil fuels will change the shapes of mankind **tomorrow**.
       b.   Aldous fell **on Sunday** from the third floor. After much agony and medical attempts to save her the fall ended up killing her **on Tuesday night**.
       c.   The snow melt **on Sunday** eventually flooded the valley **on Thursday**. (M. Rappaport Hovav, p.c.)

Turning to our analysis, we assume the Voice$_c$ head (of type $\langle\langle s,t\rangle,\langle s,\langle s,t\rangle\rangle\rangle$) to introduce an eventuality or fact i and to state that this eventuality/fact i causes the vP-event, see (33). That is, we assume reference to an explicit causal relation in the semantics of this functional head (thereby departing from the conception of Voice$_c$ in, e.g., Pylkkänen (2008) and Alexiadou et al. (2015)).
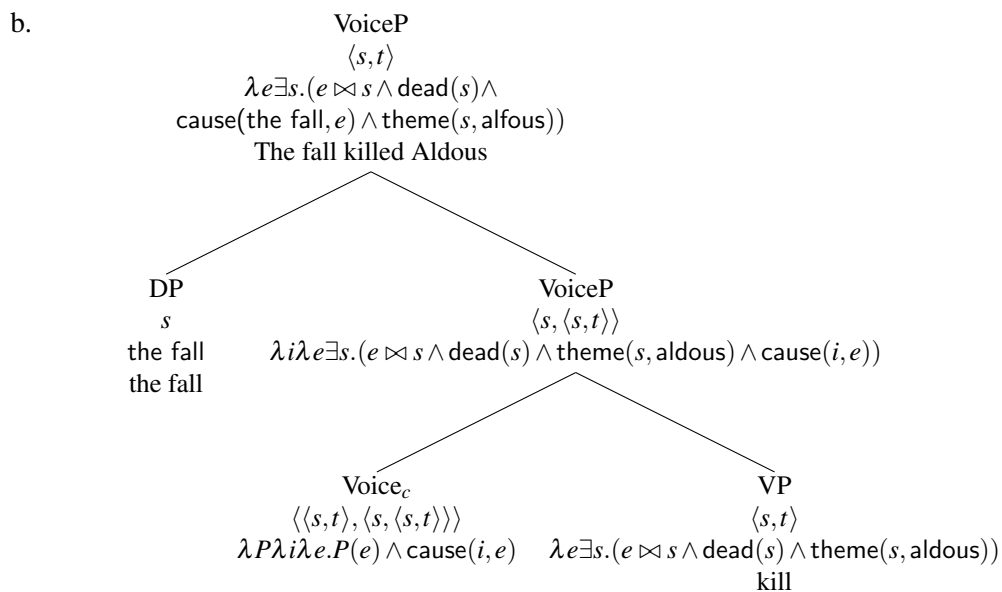
(33)   Voice$_c$ ⤳ $\lambda P_{\langle s,t\rangle}\lambda i_{\langle s\rangle}\lambda e_{\langle s\rangle}.P(e)\wedge\mathsf{cause}(i,e)$ $\langle\langle s,t\rangle,\langle s,\langle s,t\rangle\rangle\rangle$

In line with Rose et al.'s (2021) proposal on the meaning of *cause*, we take the operator cause encoded by Voice$_c$ and overtly spelled out by the verb *to cause* to convey both the *dependence* notion of causation, i.e., some kind of relation of dependence between cause and effect (defined in terms of counterfactuality, probabilities, etc), and the *production* notion of causation, under which causation involves a (typically physical) transfer of forces between events or physical objects (see Copley & Wolff 2014 for discussion on these two notions of causation in a linguistic context). When the causally responsible entity is an event, this event can temporally precede the vP-event, which explains why separate modification as in (15) is possible.[8]

On this view, Voice$_c$ does not carry *thematic* information, in that it does not associate a thematic role to a participant of the vP-event (on this point, we depart from the conception of Voice$_c$ in Pylkkänen 2008 and Alexiadou et al. 2015). A causer DP does not denote a participant to the vP-event; rather, it introduces the eventuality or fact causally responsible for the vP-event (or what Neeleman & Van de Koot 2012 call the crucial contributing factor). We give in (34b) the semantic derivation for (34a).

(34)   a.   The fall killed Aldous.

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[8] However, we do not assume causation to require temporal precedence. Therefore, the event denoted by the causer subject and the vP-event can in principle be simultaneous (in contrast, the vP-event *must* precede the ensuing state, given the semantics of the abut relation).

b.

$$\text{VoiceP}$$
$$\langle s,t\rangle$$
$$\lambda e\exists s.(e\bowtie s\wedge \mathsf{dead}(s)\wedge$$
$$\mathsf{cause}(\text{the fall},e)\wedge\mathsf{theme}(s,\text{alfous}))$$
The fall killed Aldous

DP
s
the fall
the fall

$$\text{VoiceP}$$
$$\langle s,\langle s,t\rangle\rangle$$
$$\lambda i\lambda e\exists s.(e\bowtie s\wedge\mathsf{dead}(s)\wedge\mathsf{theme}(s,\text{aldous})\wedge\mathsf{cause}(i,e))$$

$$\text{Voice}_c$$
$$\langle\langle s,t\rangle,\langle s,\langle s,t\rangle\rangle\rangle$$
$$\lambda P\lambda i\lambda e.P(e)\wedge\mathsf{cause}(i,e)$$

$$\text{VP}$$
$$\langle s,t\rangle$$
$$\lambda e\exists s.(e\bowtie s\wedge\mathsf{dead}(s)\wedge\mathsf{theme}(s,\text{aldous}))$$
kill

In line with much literature (e.g. Levin & Rappaport Hovav 1995, Reinhart 2000, Davis & Demirdache 2000, Doron 2003, Levin & Rappaport Hovav 2005, Alexiadou et al. 2006, Kallulli 2006b, Folli & Harley 2008, Schäfer 2008, Alexiadou et al. 2015), we assume that external arguments of transitive causative predicates necessarily are either agents or causers (van Valin & LaPolla 1997, Borer 2005, Ramchand 2008 for assume a more abstract role encompassing agents and causers in our typology, and in that respect subscribe to the even more restricted view according to which there is only one type of external argument). External arguments cannot be associated with the role Theme (see Kratzer 1996 on Holder Voice with stative transitives). Also, there are no additional flavours of Voice for instruments or accidental agents. Reduced agents are still agents. We thus adopt a semantics for the agent role which is flexible enough so as to cover any type of non-canonical agents (see next section). Nominative instrumental subjects can be subsumed under agents, others under causers (Schlesinger 1989, Alexiadou & Schäfer 2006).[9]

In (35a/b), we recapitulate the assumptions made in this section about the external argument of change-of-state verbs.

(35) a. External arguments of change-of-state verbs are either agents or causers.
      b. Agent subjects denote individuals; they participate in the vP-event.
      c. Causer subjects denote eventualities, facts or state-of-affairs; they cause the vP-event.

From (35b/c), it follows that for us, in the context of change-of-state verbs, the distinction between agents and causers maps the distinction between individual-denoting DPs (of type e), and situation-denoting DPs (of type s): in the subject position of a transitive (and non-stative) change-of-state verb, an individual-denoting DP is necessarily an agent (no matter whether it is animate or not), and a fact- or eventuality-denoting DP is necessarily a causer.[10]

The distinction between agents and causers is not just a terminological issue: it is key for instance to the understanding of the difference between manner (or *hit*-) verbs and result (or *break*-) verbs

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[9] Similarly, DPs denoting natural forces can be agents or causers (just like instruments), depending on whether they denote an individual or an event. DPs such as *the rain* are flexible and can be used as individual- or event-denoting expressions, while others such as *the sun* or *the sea* systematically behave as individual-denoting DPs, as will be shown in the next section.

[10] An anonymous reviewer asks why we do not dispense from the notions of agents and causers altogether given our assumptions (35b/c). The reason why we do not do so is that we still need the concept of agency to define agents and to distinguish agentive from non-agentive (e.g. theme) individual-denoting DPs. We also still need the notion of cause to isolate causers from other situation-denoting DPs.

(Levin & Rappaport Hovav 2005, Alexiadou et al. 2015). While result verbs are compatible with event-denoting (causer) subjects, manner verbs are not. Thus for instance, the manner verb *hit* cannot host an event description in subject position, see (36a) vs. (36b): its subject must be of semantic type *e*.

(36)   a.   The stone hit the window.
       b.   #The falling of the stone hit the window.

For us, *the stone* is, therefore, an agent (or effector) in (36a), not a causer. We address agentive inanimate subjects in more detail in the next section.

3.2   Inanimate subjects

Previous research is not always very clear about the exact differences between agent vs. causer subjects. While there is agreement for some that animacy is not presupposed by agentivity and that agents in the grammar can be inanimate (see, e.g., Cruse 1973, Delancey 1985; 1990, Alexiadou & Schäfer 2006, Folli & Harley 2008, Fauconnier 2012, Lowder & Gordon 2015, Alexiadou et al. 2015), inanimate subjects are often classified as causer subjects except when they are clearly instruments. This suggests in turn that the distinction between agents and causers maps in practice the distinction between animate vs. inanimate subjects.

As just mentioned in the previous section, for us the key difference between agent and causer subjects lies in the *semantic type*. Inanimate external argument DPs are either causer or agent subjects depending on whether they denote an individual or an eventuality/fact (section 3.2.1). By contrast, animate external argument DPs are preferentially associated with the role of agent in the context of a concrete verb (section 3.3). There is no clear evidence that animate external arguments can be reinterpreted as event- or fact- descriptions in the context of *concrete* causative verbs (as shown in section 3.3.1).

3.2.1   Inanimate subjects are causers or agents

We give in (37)-(39) examples of subjects of eventive predicates classified as causer subjects in Kallulli (2007), Folli & Harley (2008) and Alexiadou et al. (2015) respectively.

(37)   Folli & Harley (2008)

       a.   The branch (broke the window).
       b.   The gust of wind (broke the window).
       c.   The sea (ate the beach away).
       d.   The storm (broke the window).

(38)   Kallulli (2007)

       a.   The earthquake (broke the window).
       b.   The pressure (cracked the window).

(39)   Alexiadou et al. (2015)

       a.   The lightning (*cut the clothesline).
       b.   The rocks/the storm (broke the window).
       c.   The wind/the hurricane (broke the vase).
       d.   A stone (broke the window).

e.   The smoking of cigarettes (worsened the air quality in the room).
f.   The sea air (rusted the fence).
g.   The fire (destroyed the package).
h.   The storm (destroyed the painting).
i.   The sun (dried my hair).

Many DPs in these examples are or at least can be event-denoting. Event-denoting DPs are compatible with Vendler's (1967) event-selecting expressions such as *occur, take place, begin, end, take up (time)*, etc., see (40).

(40)   The earthquake/fire/storm took place/began/ended at twelve o'clock.

Some nouns in the same lists, such as *pressure*, are not very compatible with these expressions (see (41)), but are completely acceptable with Vendler's (1967) proposition/ fact-selecting expressions such as predicates like *be informed of* or *deny*, see (42). For Zucchi (1998: 176, 202, 204 a.o), these predicates select for propositional entities.

(41) ?The high pressure took place/occurred at 12. o' clock.

(42)   I am informed of the high pressure.

Following Martin et al. (2023), we take subject DPs of causative verbs containing a noun of the latter type to work in some cases as concealed fact descriptions; for instance, we take (43a) to have the same meaning as (43b) in at least one of its readings.[11] We take such subjects in their fact-denoting use to be introduced by causer Voice, just as subjects DPs which are overtly fact-denoting like *The fact that ...* in (30) above.

(43)   a.   The high pressure changed the material.
       b.   That the pressure was high changed the material.

A third type of DPs listed in (37)-(39), namely, those formed with *branch, sea, sun, rock, sea, air* and *stone* are incompatible both with event-selecting expressions (and this even with modifiers like *moving* or *flying*), see (44), and fact-selecting expressions, see (45).[12]

(44)   a. #The (flying) stone took place at 12. o' clock.
       b. #The (falling) branch started at 12. o' clock.
       c. #The branch/sea/sun/rock/sea air/stone ended at twelve o'clock.

(45)   a. ??We informed him of the branch.
       b. ??We informed them of the sun.

As these inanimate DPs cannot be causer subjects (they are neither event- nor fact-denoting), they must be agent subjects under our assumption that the subject of causative verbs is either a causer or

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[11] While we believe that these subject DPs can work as concealed fact descriptions in the context of change-of-state verbs, we do not think that such DPs are fact-denoting in all contexts; for instance, *I felt the high pressure* certainly is not paraphrasable by *I felt the fact that the pressure was high* (we thank an anonymous reviewer for pushing us to make this point clearer).

[12] There seems to be a difference between *inform of* and *inform about*: both select for propositional entities, but while *inform of* is not able to coerce an individual-denoting DP (like *the branch*) into a fact-denoting one, *inform about* seems to be able to do so. For instance, *I'm informed about the branch* can easily convey the idea that I'm informed about the existence of any other salient fact involving the branch.

an agent. Obviously, inanimates are never doing things with agent control, but they can be 'doers', i.e., 'do' something in the broad sense of the term (Cruse 1973). This suffices for them to qualify as agents (see the discussion in Cruse 1973, DeLancey 1991).

Furthermore, we assume with Dowty (1979: 118) or Demirdache (1997) that the role of agent conveyed in grammatical forms of natural language to characterize humans has more to do with the notion of agent control than with the concept of intentionality. In order for the role of agent to be applicable both to inanimate and animate entities, we assume with Joo et al. (2023) and Martin et al. (2022) that the role of agent has a weak 'just effector' meaning characterized in (46a) which is the single meaning inanimate non-instrumental agents can satisfy, and a stronger 'in-control agent' (ic-agent) meaning characterized in (46b). The latter meaning asymmetrically entails the former (ic-agent entails agent but not vice-versa). The ic-agent meaning is preferred to the agent ('simple effector') meaning in the context of an animate agent via Dalrymple et al.'s (1998) Strongest Meaning Hypothesis (Joo et al. 2023 and Martin et al. 2022). Our meaning of Voice$_{ag}$ is then given in (46c), where 'ic' stands for in-control.

(46)   a. $\forall e \forall x (\text{agent}(e,x) \rightarrow \text{effectivity}(e,x))$
         (Any 'agent' is characterized by the dimension of effectivity)
   b. $\forall e \forall x (\text{ic-agent}(e,x) \leftrightarrow \text{agent}(e,x) \wedge \text{control}(e,x))$
         (in-control agent (ic-agent) holds of e and x just in case agent holds of e and x and control holds of e and x)
   c.   Voice$_{ag} \rightsquigarrow \lambda P_{\langle s,t \rangle} \lambda x \lambda e.(\text{ic-})\text{agent}(e,x) \wedge P(e)$ (Joo et al. 2023)

3.2.2   The subject-related event inference triggered by inanimate agents

In the previous section, we saw that DPs such as *the stone* or *the branch* are individual-denoting only, and cannot be reinterpreted as event (or fact) descriptions. However, previous research has argued that when such DPs are used in the subject position of some transitive verbs, it is understood that their inanimate referent is involved in some implicit event distinct from the vP-event (Vecchiato 2004, Martin 2006: section 8.4). For instance, sentences like (36a) (*The stone hit the window*) are typically interpreted as meaning something like *The falling stone hit the window*.[13] But such DPs denote *an entity involved in an event*, *not* an event: they are of type *e*, not *s*, thus they are effective agents for us.

Typically, the event the inanimate subject takes part in (henceforth *subject-related event*, e.g., the falling event in the case of (36a)) is not part of the at-issue content of the causative statement (see Vecchiato 2004: 345 on Italian data, Martin 2006 on French data).[14] For instance, in (47a), the event involving the ladder that could have resulted in the breaking of the vase (e.g. its falling in the direction of the vase) tends to outscope the adverbial *quasi* 'almost', and in (47b), the event involving the iceberg that could have resulted in the sinking of the Bismarck (e.g. a collision with the boat) tends to outscope negation. The counterfactual reading (that Jacobs 2011 in another context calls the 'nothing happened' reading) where the ladder or the iceberg was not at all involved in an event that could have resulted in the theme's change-of-state is not available in a default context.

(47)   a.   The ladder almost broke the vase.
         $\rightsquigarrow$ An event involving the ladder that could have yielded a breaking of the vase occurred.   (see Vecchiato 2004: 344)

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[13] And in fact, it has been claimed that the addition of event modifiers like *falling* or *flying* sometimes increases the acceptability of inanimate subjects of clauses involving lexical-causative verbs (Alexiadou & Schäfer 2006).

[14] As their observations extend to English, we translate their Italian and French examples into English.

b. The iceberg didn't sink the Bismarck.
⤳ An event involving the iceberg that could have yielded a sinking of the Bismarck occurred. (see Martin 2006: 355)

This subject-related event inference is, however, defeasible; e.g., it is possible to cancel it in (47a, b) by a discourse continuation such as *...in fact, the ladder/the iceberg didn't move at all*. While the exact nature of this inference does not concern us here, a plausible analysis is to define it as a *soft* presupposition. Soft presuppositions are non-at-issue background inferences which can be canceled in embedded environments (Abusch 2010), or even unembedded ones (Gyarmathy 2015), because they arise from pragmatic reasoning.[15] In contrast to soft presuppositions, hard presuppositions (e.g., those triggered by the definite determiner) are hard to cancel, because they are lexically triggered (see Abusch 2010, Abrusan 2022 for discussion). Soft (respectively hard) presuppositions are named probabilistic (respectively deterministic) presuppositions in Merin (2004).

The subject-related event presupposition of causative statements with an individual-denoting inanimate subject is stronger when the subject DP is definite than indefinite, compare for instance *It is possible that the stone hit the window* with *It is possible that a stone hit the window*. This is not surprising, since when the entity described by the subject is discourse-familiar, it is more likely that an event involving this entity is discourse-familiar, too.

Causative statements built with an in-control animate agent subject, by contrast, are completely compatible with the 'nothing happened' reading, under which the agent was about to do something that could have yielded a vP-event (Vecchiato 2004, Martin 2006). So for instance, (48a/b) are completely fine in a 'nothing happened' reading; in other words, these sentences do *not* trigger (⤳̸) the inference that an event involving the subject's referent happened.

(48) a. Chiara almost broke the vase.
⤳̸ An event involving Chiara that could have yielded a breaking of the vase occurred.
(see Vecchiato 2004: 344)

b. The Navy didn't sink the Bismarck.
⤳̸ An event involving the Navy that could have yielded a sinking of the Bismarck occurred. (see Martin 2006: 355)

In summary, in the subject position of causative verbs, inanimate DPs like *the ladder, the iceberg* or *the stone* are inanimate *agents*, not causers. Causal statements built with individual-denoting inanimate DPs trigger the (non at-issue) inference that a subject-related event occurred. In section 4, we argue that this (covert) subject-related event involving the (overt) inanimate agent is understood as the cause of the vP-event. That is, under our approach, sentences such as *The ladder broke the vase* are elliptic versions of statements such as *By tipping over, the ladder broke the vase* (where the subject-related event is put in the background and causes the vP-event). On this view, the inanimate is the agent of the vP-event *because* it is involved in the covert, presupposed event.

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[15] For Martin (2006: section 8.4.3), the pragmatic principle behind this inference is a sort of 'Don't run before you can walk' principle (in French, *Ne vends pas la peau de l'ours avant de l'avoir tué* 'Don't sell the bear's skin before you've killed it.'). That is, we assume that when the speaker makes the occurrence of the vP-event at issue, necessary conditions for the event to occur are taken to be met in the common ground. In the context of (47a) for instance, we reason that if the speaker makes the occurrence of a breaking of the vase by the ladder at issue, then the necessary conditions for such an event to occur are assumed to be met in the common ground. In particular, the ladder is in movement and involved in an event. In contrast, when the subject is an in-control animate agent, necessary conditions for the vP-event to occur are automatically taken to be fulfilled, because then, the key necessary condition for the vP-event to occur is the capacity of the agent to put their agentive dimensions into action (desire, control, etc), and this capacity is supposed to hold in a default context. For this reason, there is no need to presuppose the occurrence of a subject-related event in the context of an in-control agent subject.

3.3 Animate subjects

We now turn to animate subjects of causative verbs. We first show that in the context of causative verbs taken in their concrete sense, animate subjects tend to stick with their literal individual-denoting interpretation (of type e), which means, for us, that they are interpreted as agents. Secondly, we show that a subject-related event inference is presupposed by lexical causative statements in the context of inadvertent (out-of-control) animate agents.

3.3.1 Animate subjects are preferably agents

van Valin & Wilkins (1996: 301) defend the 'metonymic clipping hypothesis' according to which in a causative statement, an agentive animate DP "stands in for the whole causing-event sequence". According to this idea, in a statement such as *Nina broke the vase*, the human subject DP is underlyingly a description of the causing event. In the same vein, Kallulli (2006a; b) argues that agent DPs are similar to event-denoting causer subjects such as *the wind*, although for her, this is the case only when the referent acts inadvertently.

   However, at least in the context of concrete causative verbs, we do not see any positive piece of evidence for the hypothesis that animate DPs can be causer subjects under the definition adopted here (where causers are eventuality- or fact-denoting). Rather, we only see evidence against it. Firstly, animate DPs are not felicitous with Vendler's event-selecting expressions:

(49)   a. #Angelika happened in the kitchen.
       b. #The cat occurred at midnight.

   Second, animate DPs are not very felicitous either as complements of Vendler's (1967) fact/proposition-selecting expressions (see (50)):

(50)   a. ??We informed Ana of Kathleen.
       b. ??We denied Tom.

Third, it has been argued that a *from*-PP requires an event description in its complement (Alexiadou & Schäfer 2006, Copley & Harley 2015), see (51a). We observe that *from*-PP can also host fact-denoting expressions, see (51b). Animate DPs are not acceptable in causal *from*-adjuncts (51c), suggesting that they cannot be easily reinterpreted as event descriptions in the context of concrete change-of-state verbs.

(51)   a. The window broke from the explosion.
       b.   The world changed from the fact that the nuclear option arose.
       c. #The window broke from Johannes.

   We therefore conclude that animate DPs neither form causer DPs nor causer PPs in the context of change-of-state verbs, at least when taken in their concrete sense.

   It is not the case, however, that animate DPs are never reinterpretable as concealed event descriptions (of type s). But it seems that very specific contexts are required for the reinterpretation process to be triggered. For instance, in so-called pancake sentences as in (52) (Wechsler 2013), the agreement mismatch between the subject DP and the vP triggers a reinterpretation process: a subject denoting individual x in its literal reading is reinterpreted as a description of an event involving the individual x (Greenberg 2008, Martin et al. 2020):

(52) a. Pancakes is good.
             ≈ Baking, buying, eating, ... pancakes is good.
      b. Angelika and Hamida is the way.
             ≈ Inviting, calling, ...Angelika and Hamida is the way.

Furthermore, previous work argued that the human subject of a subset of causative verbs, namely causative *psych*-verbs (such as *surprise, worry*) can also stand for a covert description. For instance, Bott & Solstad (2014: section 3.2.1) provide arguments in favour of the view that in the non-agentive reading of examples such as (53), the proper name is 'merely a placeholder, as it were, for something which is semantically more complex'.

(53) Peter annoyed Mary.

As an additional argument, we note that with many causative psych-verbs, the literal referent of an animate DP does not need to exist at the time of the vP-event; i.e., these verbs are not existence-entailing with regard to their subject, just as some subject-experiencer psych-verbs (e.g., *admire*) do not entail the existence of their object (see d'Ambrosio & Stoljar 2023 for experimental work on subject experiencer psych-verbs). For instance, (54) below is something one can say, while the literal referent of the subject cannot plausibly exist at the reference time. This indicates that the human DP stands there for something more abstract, as Bott & Solstad (2014) among others suggest.

(54) My great great great grand-mother surprised me again this morning.

By contrast, concrete (non-psychological) causative verbs are existence-entailing with regard to their animate subject:

(55) #My great great great grand-mother broke a window again this morning.

Therefore, we conclude that animate DPs used as subjects of causative verbs taken in their physical/concrete sense are understood as referring to an individual, which makes them automatically agentive subjects within our typology of external arguments.

We now turn to the case of out-of-control (inadvertent) agents and show that in the context of such subjects, causative statements tend to trigger the same kind of event-related inference as causer subjects.

3.3.2 The subject-related event inference triggered by inadvertent animate agents

Recall that for Kallulli (2006a; b), inadvertent agents are semantically similar to causers such as *the explosion*. For us, animates in the subject position of concrete causative verbs remain agents even when they act inadvertently: animate DPs are not easier to reinterpret as event- or fact-denoting when the referent acts inadvertently. For instance, (51c) still is infelicitous in a context where Johannes is not in-control of his behaviour.

Nevertheless, we agree with Kallulli (2006a; b) that inadvertent agents are closer to causer DPs than 'normal' agents are. While inadvertent agent subjects do not denote events or facts, we propose after Vecchiato (2004) and Martin (2005) that, like inanimate subjects denoting entities, they yield statements which presuppose an event e involving the individual denoted by the subject, such as e causes the vP-event.

Thus for instance, the statement (56a) (in the reading where *almost* scopes over the whole vP)[16] tends to be asserted in a context where it is presupposed that Gianni did something that could

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[16] Whe thus discard the irrelevant reading where *almost* scopes only over the adverbial *inadvertently* so that the breaking event ends up taken for granted.

have led him to be the inadvertent agent of some breaking of the vase. The 'nothing happened' reading, where Gianni is not involved in any event at all, is not available (Vecchiato 2004: 345). Similarly, the statement (56b) tends to be uttered in a context where it is taken for granted that I did something that could have resulted in me being the accidental agent of a shoes-untying event (Martin 2005: 468); for instance, I stumbled.[17] By contrast, if we replace *inadvertently* by *intentionally*, the nothing-happened reading is available again.

(56) a. Gianni almost inadvertently broke a vase.
      b. I almost inadvertently untied my shoes.

Similar observations have been made for unrelated languages. For Salish languages, where so-called limited/non-control transitivizers are used in contexts where human agents act inadvertently, data gathered by Bar-el (2005), Jacobs (2011) among others suggest that in presence of the Salish limited/non-control morphology, some event involving the subject's referent that could have developed into a vP-event outscopes the negation and *almost*-adverbials. What Jacobs (2011) calls the 'nothing happened' reading is available with the control morphology only; see Jacobs (2011: 122 & 128). In Tagalog, *maka* is another out-of-control morphology, conveying inadvertent agency. Dell's (1983) description of Tagalog suggests that *maka*- statements embedded under attitude reports like *be surprised to* presuppose some discourse-familiar event involving the subject's referent that could develop into a vP-event, by contrast with statements with the neutral form; see Dell's (1983) examples (21/22), p. 183.

In a sense, descriptions of causation events performed by an out-of-control agent exhibit the same bipartite structure as *by P, Q* statements (*By stumbling, I untied my shoes*; see Anscombe 1963, Schnieder 2008, Sæbø 2018 a.o.), except that the *by*-locution remains implicit in sentences like (56): it is taken for granted at the assertion time that the agent is involved in some event, and what is asserted is that by being so, the agent *V*-ed. For instance, (56b) is typically uttered in a context where a stumbling event is taken for granted (backgrounded) and/or discourse-familiar.

This analysis actually echoes van Valin & Wilkins's (1996) and Kallulli's (2006a) idea mentioned above, according to which the animate subject DP stands for an implicit description of an event. With a crucial difference, however: for us, the animate DP is *not* reinterpreted as an event description; it keeps its literal (individual-denoting) reference, but the causal statement is interpreted against the background of an implicit description of an event involving the DP's referent.

To conclude, animate DPs are preferentially interpreted as agentive, individual-denoting DPs. However, when the animate DP refers to an accidental/out-of-control agent, the ensuing causal statement tends to (softly) presuppose the occurrence of a subject-related event, distinct from the vP-event.

In the next section, it is argued that whenever there is a subject-related event, either because a causer subject directly denotes it or because it is softly presupposed in the context of an inanimate agent or an animate out-of-control agent, the vP-event *e* is understood as caused by this subject-related event. Figure 2 summarizes our proposal. Instrumental agents are excluded from the figure as they are inanimate but nevertheless behave in a control way. We show in the next section that instrumental agents exactly pattern like animate in-control agents, thereby confirming again that agent control is the key dimension of 'strong' agency as it is grammaticalized in natural language.

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[17] Vecchiatto's and Martin's observations are again translated from Italian and French as they extend to English. Their examples did not contain the adverbial *accidentally*, that we added for clarity. But the facts are similar even in the absence of such an adverbial, in a context where the subject is an accidental agent.

Figure 1: Types of external arguments for causative verbs.
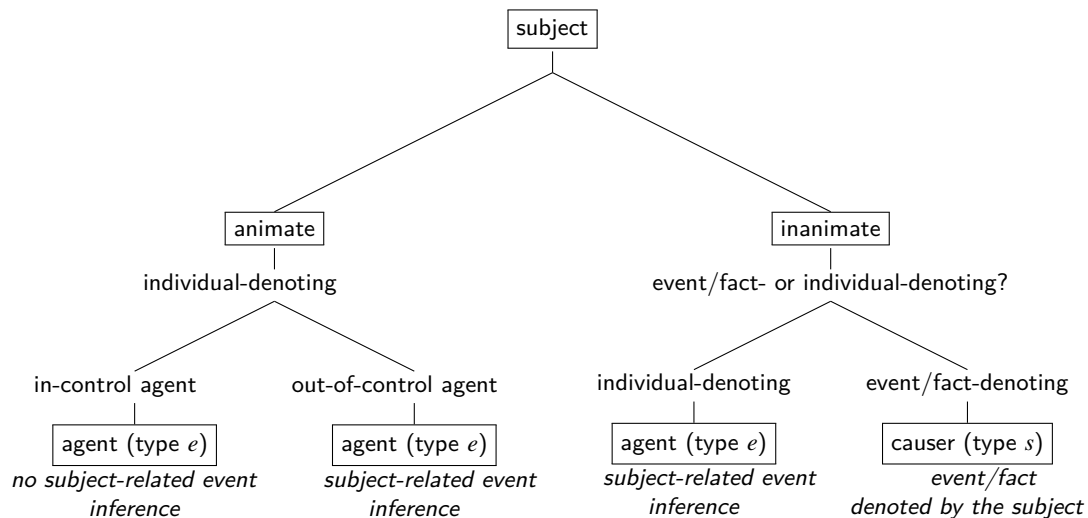
4   How subjects affect the use and meaning of the vP-event

Events and states ontologically depend on their participants. It is their participants that determine the spatiotemporal extent of events (Parsons 1990, Asher 2000 among many others). The more participants an event hosts, the bigger the event is. For instance, a piece-of-paper-burning-event is spatiotemporally bigger when it involves an agent than when it involves the piece of paper only. When the burning event just hosts a theme participant, it is a pure inchoative change-of-state event. But when an (animate or inanimate) agent is added to it, the burning change-of-state event is a full causation event summing a causing event and its outccome.

One-participant and two-participant change-of-state events also have different temporal beginnings (or left boundaries). A one-participant burning event starts when the change-of-state starts, but a two-participant burning event may start before this point, because the causing event can start before the ensuing change starts. For instance, when John or the sun burns a piece of paper, the burning causing event can start before the paper starts burning.

But can we *identify* the moment when a causing event started before it triggers its effect (e.g., before the piece of paper started burning)? As Martin (2015: 4.3.2) observes, the way we identify the left boundary of a causation event depends on whether it involves an in-control agent or not (and in-control agents can be either persons, or instruments). Causation events involving an in-control agent can be associated with a clear beginning before they trigger the intended change. As a result, we easily identify the burning causation event as starting once the action starts. For instance, when John decides to burn the piece of paper, the causing event has a clear beginning which can be identified independently of the targeted effect: it starts as soon as John puts its intention into action (he retrieves a lighter from the kitchen's drawer, etc.). But when can we say that the sun begins to burn a piece of paper, if not when the paper starts burning? On which ground can we decide that the sun begins to burn it at a particular moment m, if the piece of paper did not start to burn yet? It is in general much easier to conceive a causation event as starting before its effect started when this causation event is performed by an in-control agent, because the agent's behavior is indicative of its goal before this targeted outcome is achieved.

We believe that this difference in the way we conceptualize the beginning of causations events in the presence or absence of an in-control agent crucially affects the way we use and understand change-of-state verbs. Recall that for us, the semantics of change-of-state verbs is pretty minimal in that these verbs only encode a temporal 'abut' relation between the event in their denotation and

the ensuing state. Further, we proposed that these minimal semantics are pragmatically enriched as formulated in the 'inchoative hypothesis', repeated below for convenience:

(24)   INCHOATIVE HYPOTHESIS. Change-of-state verbs tend to be used and understood as descriptions of a mere change, except in the context of an agent, in the presence of which change-of-state verbs can easily be used to describe a full causation event (that is, a combination of cause and effect).

In other words, except in the context of an agent subject, the causation event reported by a causative statement is typically described by the vP *only partly*: the vP is used and understood as a description of a BECOME-event. The event (or fact) causing this change is *not* denoted by the vP but by the external argument causer DP (if present).

   Furthermore, we argue that it is only in the context of *in-control* agents that it is easy to conceive the full causation event denoted by the vP as starting before the change proper starts. With out-of-control animate agents or inanimate agents, the full causation event is typically identified only once the change starts. For instance, in a statement like *I inadvertently untied my shoes*, the causation event described by the vP is understood as taking place only when the change is triggered, not before that. We summarize this second hypothesis as follows:

(57)   Causation events involving an in-control agent (either animate or instrumental) can be identified as ongoing before the targeted change takes place (they start as soon as the intention or plan is put into action), while causation events that do not involve an in-control agent are identified as ongoing once the change starts only.

   We substantiate these two hypotheses in the following subsections. We look at in-control agents in section 4.1, and at all other cases in section 4.2.

4.1   Use and meaning of lexical causative verbs in the presence of an in-control agent

Dowty (1977: 67) already observed that an agentive accomplishment in the progressive can be used while the related change has not started yet: '... an imperfective [standard progressive] sentence such as *John is drawing a circle* may be truly uttered on certain occasions when no portion of a circle exists yet on paper, but when John is merely observed to be making preparations to draw (assembling compass and paper, etc.) and his intentions are known.' Given that the progressive returns a part of an event denoted by the vP, this suggests in turn that an agentive vP-event can start before the change starts.[18] Similarly, Truswell (2011: 101) observes that (58b) is judged true in the context (58a), while the food has not been affected at all yet.

(58)   a.   It had been a disastrous picnic, one which was really best forgotten. Tom clearly agreed, as he had picked up a nearby can of petrol and a box of matches, and was now approaching the leftovers with a look of steely intent on this face. Dick frowned. 'What's wrong?', asked Harry.
        b.   'Tom's destroying what's left of the food', said Dick.   (Truswell 2011: 101)

Example (18a) repeated below under (59) illustrates the same point: in the context of an in-control agent subject, a causative vP denotes a full causation event that can in principle start before the targeted change starts.

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[18] Dowty's observation extends to French, which does not have a futurate progressive, and therefore cannot be explained away by the futurate meaning of the progressive in English.

(59) I'm waking Ana up – I've shaken her twice! but she's dead to the world – she hasn't even begun to flutter her eyes yet. (Harley & Folli 2023, adapted from Martin 2015)

Interestingly, instrument subjects, referring to entities whose purpose and function is to trigger a change-of-state of the type described by the verb, exactly pattern with in-control agents in this respect: the beginning of the instrument's activity allows one to identify the left boundary of causation events as clearly as an intention-in-action does, and this even when the targeted change hasn't started yet. So for instance, (60) is felicitous, too.

(60) The alarm-clock is waking Ana up – it already rang three times! but she's dead to the world – she hasn't even begun to flutter her eyes yet.

Martin (2015; 2020) offers two further pieces of evidence showing that when an event described by a change-of-state verb involves an in-control agent, this event can in principle start earlier than the change itself. The first concerns *in*-adverbials. Time span *in*-adverbials measure the time span between the onset and the telos of events in the extension of the predicate they apply to. The telos of causing events corresponds with the onset of the result state. When causative verbs are used agentively, one can have 'separate' *in*-modification for the causing event and the change of state such that it is entailed that the former starts before the latter. Imagine for instance that Silvia takes part in a game where a glass must be broken by shooting arrows with a bow. She tries 2 minutes long and then manages to break the glass. In that context, (61) is fine, although the glass itself is only affected at the very end of the 2 minutes span. This shows again that the agentive component of the event in the extension of the causative verb starts before the inchoative component.[19]

(61) Silvia broke the glass in 2 minutes (this being said, the glass broke in less than 2 seconds).

Another way to establish the same point is illustrated below.

(62) a. John has to wake up Ana and puts his intention into action at 10.00. At 10.15, Ana woke up.
      b. → John woke up Ana in 15 minutes.

In the situation described in (62a), (62b) is necessarily true, which is expected if the waking up event initiated by an agent starts once the intention is put into action.

Instrumental subjects again pattern with in-control (animate) agent subjects. For instance, if (63a) is true, then (63b) is true, too.

(63) a. The alarm clock started to ring at 10.00. At 10.15, Ana woke up, and it was because of the alarm clock.
      b. → The alarm clock woke up Ana in 15 minutes.

Second, the aspectual verbs *start/begin* embedding an in-control agentive causative vP may felicitously describe a situation where the action started while the targeted change did not yet. For instance, the *start*-statements in (64) entail that an agentive breaking by the workers has started, because the onset of the action is also the onset of the causation event. But in an appropriate context, this action, performed with the goal of triggering a specific change in the theme, may start although the change itself hasn't been initiated yet, which explains why (64a/b) are not contradictory.

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[19] An anonymous reviewer observes that in such a context, *take X time* might be more natural than an *in*-adverbial. We tend to agree with this observation; but this does not undermine the point we are making about the interpretation of (61).

(64) a. The workers started to break the wall (but the wall only started to break after some
          time, because it was very hard).
      b. Nina started to open the bottle of wine, but the cork broke inside the bottleneck before
          it started moving out, and the bottle had to sadly remain closed.

Replacing *the workers* or *Nina* by *The construction/ domestic robot* would not affect the judg-
ment, which confirms again that instruments just are the inanimate subtype of in-control agents. In
summary, in the context of an in-control agent, the vP is used and understood as a description of
a full causation event, and it is possible to identify the beginning of it before the targeted change
starts.

4.2 Use and meaning of lexical causative verbs in the absence of an in-control agent

We now turn to cases where the event reported by the change-of-state verb is *not* triggered by an
in-control agent. We start with a discussion of causer subjects. We argue that in their case, the
change-of-state verb is used and understood as a description of a mere change. (The event (or fact)
causing this change is denoted by the causer subject, as already indicated by the possibility to have
separate modification; see section 1).
    A first piece of evidence for this concerns progressive sentences. Example (18b) repeated below
under (65) illustrates the point: the discursive continuation denying the occurrence of a change is
contradictory. This is because in the context of causer subjects, events denoted by the vP are mere
changes-of-state, and PROG picks up some part of one of these events in the vP-denotation.

(65) The noise of the dishwasher is waking Ana up, #but she's dead to the world– she hasn't
      even begun to flutter her eyes yet.   (Harley & Folli 2023, adapted from Martin 2015)

The *in*-adverbial test is also consistent with the hypothesis that change-of-state verbs are preferably
used to describe the change only in the context of a causer subject. The continuation in (66b) and
(67b) is marked because the vP-event is understood as starting when the theme's change starts.
This is again different from what we observe in the context of an in-control animate agent (see
(66a) and (67a)).[20]

(66) a. Rachida opened the safe door in two minutes by dialing the 20-digit combination code
          (that being said, the door opened in less than 3 seconds).
      b. The wind opened the safe door in two minutes (#that being said, the door opened in
          less than 3 seconds).

(67) a. The regiment burned the site in fifteen minutes (that being said, it burned in less than 2
          minutes).
      b. The fire burned the site in fifteen minutes (#that being said, the site burned in less than
          2 minutes).

Also, in the situation described in (68a), (68b) is not necessarily true, because the start of the
dishwasher program does not provide the left boundary of the vP event (which is by hypothesis
identified with the change-of-state endured by Mary, which did not start at 10.00).

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[20] Obviously, such sentences with separate *in*-modification are always a bit awkward, but our point is that they are in
principle OK with in-control agents while they are not in all other cases.
    In favour of the idea that events in the extension of change-of-state verbs are preferably interpreted as CAUSATION
events in the context of an agent subject and as BECOME events in the context of causer subjects, see also the truth-
value judgment experiment on French *in*-adverbials reported in Martin (2020: pp. 277-278).

(68) a. The dishwasher starts to run at 10.00. At 10.15, Ana woke up, and it was because of the dishwasher.

    b. ↛ The dishwasher woke up Ana in 15 minutes.

Start-statements in (69)-(70) illustrate the same point:

(69) a. The workers started to break the wall (but the wall didn't start to break before some time, because the stone was super hard).   (=(64a))

    b. The heat started to break the wall (#but the wall didn't start to break before some time, because the stone was super hard).

(70) a. Ana started to open the door. But it is so well stuck in the frame that there is a good chance that it will take long before it starts moving a little bit.

    b. The wind started to open the door (#but it is so well stuck in the frame that there is a good chance that it will take long before it starts moving a little bit).

    We therefore conclude that the vP-event tends to be identified as a mere change in the context of causer subjects.

    We now turn to the case of agents which are not in-control agents. In such cases, the vP is interpreted as describing a full causation event, just as with in-control agents. But this time, the vP-event is understood as caused by the presupposed subject-related event, and furthermore, the full causation event denoted by the vP is identified as ongoing only once the change is itself ongoing. For instance, if I accidentally untie my shoes (for example, because I stumble), I typically only realize that I am involved in an untying-my-shoes event once my shoes started to untie, not before. This is in contrast with an in-control tying-my-shoes event, which can very well be identified as already ongoing before the targeted change-of-state of my shoes has started (observe a five year's old involved in such an activity).

    The three tests we have been using previously indicate that in the context of an out-of-control agent, events in the extension of a causative vP cannot easily be asserted to start before the change starts.

    Firstly, as observed in Truswell (2011), in the context of an inadvertent agent, a progressive causative statement tends to entail that the theme starts getting affected. For instance, as the context of (71a) makes clear that the theme still is intact, the progressive sentence (71b) turns out infelicitous.

(71) a. It had been a gorgeous picnic, but with one drawback. Far too much alcohol had been involved. most of the picnickers were now sleeping it off in the shade, with three exceptions, Tom, Dick and Harry. Tom was amusing himself with a wayward, uncoordinated dance that was bringing him inexorably closer to the leftovers. Harry, who had stayed sober, surveyed the scene and frowned. 'What's wrong?' asked Dick.

    b. #'Tom is destroying what's left of the food', said Harry.   (Truswell 2011: 102)

Furthermore, the vP-event is understood as itself caused by the discourse-familiar event the agent was involved in. So for instance, if we replace (71b) with (72) below, the infelicity disappears (since it is now asserted that the change took place), and the vP-event (the destroying of the food) is understood as caused by Tom's uncoordinated dance, whose occurrence is taken for granted in the context of (72).

(72) Tom destroyed what's left of the food', said Harry.

The *in*-adverbial test also shows that the vP-event is identified as starting only once the change starts. So for instance, if you accidentally kill a mosquito after walking ten minutes long, you can't really say you killed the mosquito in ten minutes. The contrast in (73)-(74) illustrates the same point:

(73)   a.   Context. Despina is a very skillful mosquito-killer. She has very elaborate techniques which allow her to kill mosquitos quickly and efficiently. Yesterday she dealt with a particularly agile mosquito but she nevertheless managed to kill it quickly.
       b.   Despina killed the mosquito in ten minutes (that being said, it didn't suffer much as it died in less than 5 seconds).

(74)   a.   Context: Despina was sleepwalking last night. She was wandering around the room, and at one point, she stepped on a mosquito and killed it.
            #Despina killed the mosquito in ten minutes (that being said, it didn't suffer much as it died in less than 5 seconds).

When Despina is in control of her agency when she kills a mosquito, the killing-the-mosquito event can be said to start as soon as she puts her intention into action, but when she acts out-of-control and ends up accidentally killing a mosquito as a result, the killing event typically is understood as starting when the change starts, not before. Furthermore, this killing event is understood as caused by the subject-related event (in example (73), the sleepwalking activity Despina was involved in before becoming the out-of-control agent of the vP-event).

   Before concluding this section, we briefly turn to the case of inanimate agents which are not in-control (i.e., not instruments). As noticed by Bonomi (1999), Truswell (2011) and Martin (2015), progressive causative statements built with such external arguments require the theme to start getting affected, differently from what we had observed through Dowty's (1977) and Truswell's (2011) examples when the statement is built with an in-control agent. For instance, (75b), built with an inanimate agent subject, is not acceptable in the context of (75a) (Truswell 2011: 102). This is because (75a) entails that the food is not affected yet, while the progressive in (75b) returns a part of a vP-event, which is for us identifiable as ongoing only once the change has been initiated.

(75)   a.   It had been a gorgeous picnic on the beach, but now it was time to leave. The picnickers had arrived at low tide, and placed their blanket near the shore, but the tide had turned, and now each wave came a little closer to the leftovers. Tom surveyed the scene and frowned. 'What's wrong?' asked Bill.
       b.   #'The sea's destroying what's left of food', said Tom.   (Truswell 2011: 102)

Furthermore, the causation event denoted by the vP is itself understood as caused by the presupposed subject-related event. For instance, *The sea didn't destroy what's left of food* is understood as presupposing an event involving the sea, which could have caused a destruction of the food by the sea (for instance, the sea was moving towards the food because the tide).

   To conclude, except when the subject is an in-control agent, the vP of sentences built with a causative verb tends to be understood as starting once the change starts. In the context of a causer subject, the vP-event is a mere change, caused by the event denoted by the subject. In the context of agents which are not in-control, the full causation event denoted by the vP is understood as starting only once the change proper starts, and as caused by a covert subject-related event, whose occurrence is taken for granted in the context of the assertion.

   We turn next to a last type of transitive construals for change-of-state verbs with inchoative semantics, namely transitive anticausatives, and provide a detailed semantic analysis for this type of statements.

5 Transitive anticausative vPs

5.1 Properties of transitive anticausatives

Recall the three-way contrast between the non-agentive uses of *change* illustrated again with the following examples:

(76) a. The chemical process changed the gas's temperature.   non-agentive causative
    b. The gas's temperature changed.   intransitive anticausative
    c. The gas$_i$ changed its$_i$ temperature.   transitive anticausative

The pair in (76a) and (76b) exemplifies the canonical causative alternation between a transitive lexical causative verb and the corresponding intransitive anticausative verb. Example (76a) asymmetrically entails example (76b). As shown in detail in Schäfer (forthcoming), the alternation between (76b) and (76c) is different from the causative alternation. Despite the fact that (76c) is syntactically a transitive structure involving a nominative external argument DP triggering verbal agreement and an internal accusative DP, it expresses a simple inchoative event undergone by the internal argument DP, and pairs like (76b) and (76c) are truth-conditionally equivalent, i.e., the truth of one of them entails the truth of the other (such pairs only differ in their informational structuring because their nominative DPs are different): in both cases, the vP has inchoative semantics (it is understood as the description of a mere change). Therefore, transitive anticausatives illustrate another type of transitive vPs with inchoative semantics. Natural occurrences of transitive anticausatives taken from the web are given below.

(77) a. The sun increased its mass and radius.
    b. The water changed its temperature.

Transitive anticausatives also welcome event-denoting subjects, see the natural occurrences in (78) (as discussed in section 5.3 below, transitive anticausatives with human subjects are, in principle, possible, too, albeit the agent bias makes this reading less accessible). The event-denoting subjects in (78) are *not* causer subjects; as detailed below, the subject of transitive anticausatives is neither an agent nor a causer.

(78) a. The storm changed its direction.
    b. The game increased its speed.
    c. The explosion changed its shape.
    d. The earthquake increased its speed.

The central aspect of the alternation in (76b/c) is that it involves a possessive structure. The sole argument DP of the anticausative verb in (76b) is a possessee modified by a prenominal genitive possessor DP. In (76c), (as in (77a, b) and (78a-d)), this possessive relation is dissociated in that the possessor DP appears as the nominative subject and the possessee DP appears as the accusative object. Furthermore, the latter is modified by a possessive pronoun which is obligatorily bound by the nominative subject for the transitive anticausative construal to obtain (see more discussion below).

The next observation is that, across languages, only a small set of verbs undergoing the causative alternation allow the alternation illustrated in (76b/c). The majority of verbs undergoing the causative alternation do not enter the transitive anticausative construal even if the subject binds a possessive pronoun inside the object. This is exemplified below in (79)-(81). In each pair, the a-sentence provides a canonical anticausative structure where the verb's internal argument is modified with a prenominal genitive. If this prenominal genitive is turned into a subject binding the

posessive pronoun of the verb's internal argument as in the b-examples, the result is conceptually deviant in a default context. Such sentences are fine only if the subject's referent is a (reduced) agent or effector of the event (recall definition (46) of the role of agent in section 3.2.1).[21]

(79) a. The roof of the house burnt.   intransitive anticausative
      b. #The house burnt its roof.   agentive causative only

(80) a. The left wing of the gate opened.   intransitive anticausative
      b. #The gate opened its left wing.   agentive causative only

(81) a. The glaze of the cake burnt.   intransitive anticausative
      b. #The cake burnt its glaze.   agentive causative only

The above b-examples are deviant because their verbs, although undergoing the causative alternation, do not allow the construal as a transitive anticausative. Instead, the grammar enforces that their nominative subjects receive an external argument θ-role (for us, the role of agent, as these DPs cannot be used as event- or fact descriptions, and therefore cannot be causers). These sentences are canonical causative statements, entailing that the DP_{nom} did something that affected the object DP_{acc} along the scale encoded by the verb. Since such a construal, in a default context, violates our world knowledge, these sentences are conceptually weird.

Thus, transitive anticausatives can only be formed with a subset of verbs undergoing the causative alternation. The list in (82) from Schäfer (forthcoming) provides further verbs that, like the verb *change* in (76c), allow this construal (pending the right choice of theme DP):

(82) accelerate, alter, change, decrease, diminish, double, drop, enlarge, expand, halve, increase, modify, multiply, narrow, r(a)ise, reduce, stabilize, slow down, widen

The verbs in this list are all change-of-state verbs undergoing the causative alternation. However, while these verbs denote measure-of-change functions, they (can) leave the property or scale along which they measure change underspecified (or unspecified; cf. Schäfer forthcoming for details). Instead, their internal argument DP, a functional noun (Löbner 1981; 2020),[22] specifies the actual property or scale of change, and the possessor of the internal argument DP denotes the entity that changes along this scale. Consequently, the nature of the change expressed by these verbs varies with the particular functional noun they combine with. In the vP *increase the temperature of the soup*, change is measured along the *temperature*-scale, but many other scales are possible with this verb.[23] By contrast, like the majority of verbs undergoing the causative alternation, a verb like *warm* lexically specifies that temperature is the scale along which this verb measures change. We call verbs in (82) like *change* or *increase* 'underspecified-scale verbs of change'.

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[21] X, Y and Z (p.c.) note that example (81b) is better than the other examples (79b/80b), because it is easier to assume that the cake can do something which affects the glaze (because the cake was very hot when the glaze was put on it, for instance) than to assume that a house does something which affects its roof. X furthermore notes that example (80b) would require to be acceptable that the gate can open itself automatically, which also aligns with our idea that such examples are acceptable as long as the inanimate has agentive properties.

An anonymous reviewer finds examples like (79b/80b) completely fine in a context where the inanimate has no (real or fictional) agentive properties. We cannot account for this intuition the way we just proposed, and we do not understand the source of this inter-speaker variation. We ran a quick survey on social media to back up Schäfer's (forthcoming) empirical claim reported here, and almost all participants found examples (79b)-(81b) bad in their native language. We leave this point for further research.

[22] Such nouns are called property concept nouns by (Dixon 1982), 'individual concepts' by Montague (1973) or 'quality nouns' by Francez & Koontz-Garboden (2017).

[23] For example, *increase the price/the thickness/the flavor/the quantity/the volume/the nutritional value of the soup*.

Schäfer (forthcoming) substantiates the view that in transitive anticausatives, the verb only takes the internal argument DP_{ACC} but not the external argument DP_{NOM} as its *semantic* argument. Thus, the latter is not assigned any θ-role by the verb. Instead, the external argument DP_{NOM} is just interpreted as the possessor of the internal argument DP_{ACC}, as the former binds the possessive pronoun inside the latter. Thereby, the external argument is interpreted as the entity that undergoes a change along the scale denoted by the internal argument. Consequently, transitive anticausatives express the same truth-conditional meaning as the sentences headed by their corresponding canonical anticausative; transitive and intransitive anticausatives symmetrically entail each other. We provide here two tests to show this with English examples (see Schäfer forthcoming for additional tests and examples from further languages).

The first test relies on paraphrases using a causative verb such as *cause* or a light agentive verb like *do*. Causative statements built with a lexical causative can be paraphrased with such a verb and the inchoative variant of the lexical causative without change of truth-conditional meaning; for instance, (83b) roughly expresses the same truth-conditional meaning as (83a), and roughly (84b) expresses the same truth-conditional meaning as (84a).

(83) a. The temperature rise increased the volume of the gas.
      b. ≈ The temperature rise caused the volume of the gas to increase.

(84) a. Zsofia increased the volume of the gas.
      b. ≈ Zsofia did something such that the volume of the gas increased.

By contrast, transitive anticausatives and the corresponding periphrastic causative paraphrases do not have the same meaning and, thus, are not paraphrases of each other. For instance, (85b/c) enforce a non-default interpretation under which the gas is the effector of its volume increase, while in its most natural, transitive anticausative reading, (85a) does not have this interpretation. For this paraphrase to work, one has to reinterpret (85a) as a (conceptually marked) transitive causative statement (where the gas is the effector of an event causing the change).

(85) a. The gas increased its volume.   transitive anticausative
      b. ≉ The gas caused its volume to increase.
      c. ≉ The gas did something such that its volume increased.

A second test concerns negation. It is possible to negate a causative statement and subsequently assert the truth of the corresponding anticausative without contradiction, as in (86). This is because, sentential negation being focus-sensitive (Beaver & Clark 2008), it associates in the first clause with the focused subject, such that the content of TP is backgrounded, at the exclusion of the information that Zsofia is the agent of the vP-event (thus, that there was a change of Zsofia's appearance caused or performed by some entity is backgrounded–although strictly speaking negation still applies to the whole proposition). As the occurrence of the change itself is therefore backgrounded by the first clause, the subsequent clause is not contradictory.

(86) [Zsofia]$_{FOC}$ did not change her appearance, but her appearance *did* change.

By contrast, in a default context, it is not possible to negate a transitive anticausative statement and subsequently assert the corresponding intransitive anticausative, as illustrated in (87b).

(87) a. The room changed its appearance.   transitive anticausative
      b. [The room]$_{FOC}$ did not change its appearance, #but its appearance *did* change.

This is precisely because transitive and intransitive anticausatives exactly have the same truth-conditional (inchoative) meaning (namely, there was a change in the room's appearance, see next section). Therefore, focusing the subject does not allow to background the occurrence of a change in the room's appearance. This is only possible at the cost of reinterpreting the first clause of (87b) as a (conceptually deviant) causative statement.

Before proceeding to the semantic analysis of transitive anticausatives in the next section, we summarize the three necessary conditions for their formation:

(88) a. A *functional noun* in object position (in (76c), the noun *temperature*)
      b. An *underspecified-scale verb of change*, which leaves the scale of change unspecified (in (76c), the verb *change*)
      c. A binding relation between the subject and a possessive pronoun in the object DP, such that the subjects gets interpreted as the possessor of the internal argument (in (76c), *the gas* binds the possessive pronoun of *its temperature*)

Based on the third condition, it would be more accurate to display (76c) as follows:

(89)   [The gas]$_i$ changed its$_{i/*j}$ temperature.   transitive anticausative

(89) makes explicit that if this sentence is to be construed as a transitive anticausative, *the gas* and the possessive pronoun *its* must be co-indexed. If *the gas* and *its* are not co-indexed in (89), then the same string of words must be understood as a transitive causative (which would mean that the gas caused a change in the temperature of something else):

(90)   [The gas]$_i$ changed its$_j$ temperature.   agentive causative

Strictly speaking, co-indexation is also possible with the transitive causative reading in a pragmatically marked context as the one mentioned above (The DP *the gas* is then associated with the role of agent/effector, as this DP is of type e).

(91)   [The gas]$_i$ changed its$_i$ temperature.   agentive causative or transitive anticausative

On the agentive causative reading of (91), the gas caused its own temperature to change, which is not the preferred interpretation.

5.2   An analysis of transitive anticausatives

Our analysis of transitive anticausatives will be presented in three major steps, beginning with functional nouns (e.g., *temperature, size, price, volume, ...*, see Löbner 2020 and literature cited therein on these nouns).

5.2.1   Functional nouns

Taking *temperature* as a canonical example of a functional noun, a straightforward idea is that *temperature* denotes a function that applies to an ordinary object x (its possessor) and then to a time t, yielding the temperature of x at t, as formalized in (92), where ιd is the description operator and d is an individual variable for temperature degrees.[24]

---

[24] For simplicity, we keep to an extensional semantics here.

(92)   temperature $\rightsquigarrow \lambda x \lambda t.\iota d(\text{temperature}(t,x) = d)$ (the temperature d of x at t)

If (for simplicity) *the gas* is represented as the individual constant g, as in (93a), then the temperature d of g at an implicit time t' is represented in (93b).

(93)   a.   the gas $\rightsquigarrow$ g
       b.   the gas's temperature (at t') $\rightsquigarrow$
            $[[\lambda x \lambda t.\iota d(\text{temperature}(t,x) = d)](\text{g})](t') =$ (by application)
            $\iota d(\text{temperature}(t',\text{g}) = d)$ (for a value of t')

If the function represented in (92) is applied only to g, then the result is the following function on times:

(94)   the gas's temperature $\rightsquigarrow \lambda t.\iota d(\text{temperature}(t,\text{g})) = d$

  By the way, note that *the temperature of the gas* would receive the same treatment as *the gas's temperature*:

(95)   the temperature of the gas (at t') $\rightsquigarrow \iota d(\text{temperature}(t',\text{g}) = d)$ (for a value of t')

  Returning to *the gas's temperature*, we adopt a DP approach and treat it syntactically as a DP with *the gas* as a DP in its specifier position and with a syntactic feature [+POSS(ESSIVE)] contributed by the possessive clitic *'s*, which is its head, as shown in (96).

(96)
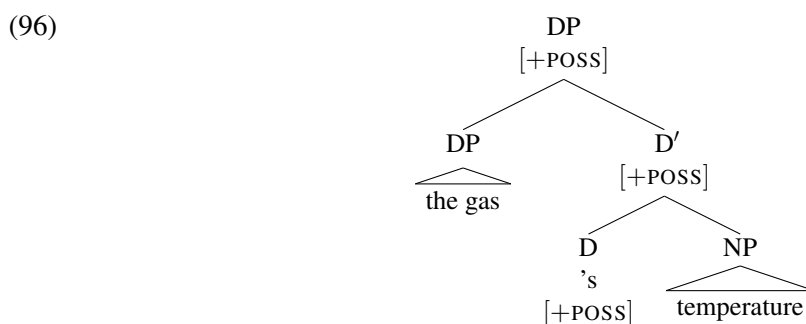
For convenience, we treat the possessive clitic *'s* as semantically inert: normally, it would contribute a two-place possessive relation (e.g., in *Hongyuan's book*), but since the property concept noun *temperature* already denotes a relation (indeed, a function), we can (again, for convenience) treat *'s* as semantically inert here. Even so, *'s* does contribute the syntactic feature [+POSS].[25]
  This concludes our basic treatment of functional nouns, which was one of the three necessary conditions for transitive anticausatives (recall (88a)).
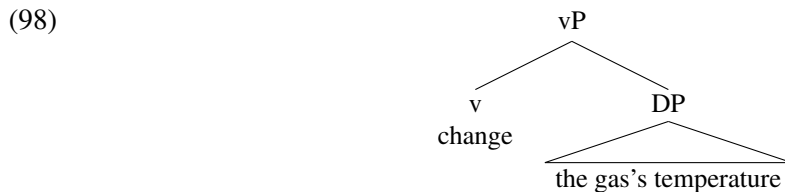
5.2.2   Underspecified-scale verbs of change

Taking *change* as a – if not *the* – canonical example of an underspecified-scale verb of change, another straightforward idea is that *change* denotes a change-of-state relation that applies to a function δ on times (of logical type $\langle e,e \rangle$) and an event e such that e temporally abuts a state s and the value of δ at the beginning of e is not identical to the value of δ during s (which follows e), as shown in (97), where $\bowtie$ stands again for 'temporally abut' and τ, for a function that gives the time of an event or state.

---

[25] The possessive relation at hand here is an instance of inalienable possession between an attribute (temperature) and its holder (the gas).

(97)   change $\rightsquigarrow$
       $\lambda\delta\lambda e.\exists s(e \bowtie s \wedge \delta(\mathrm{beg}(\tau(e))) \neq \delta(\tau(s)))$

On the anticausative use, *change* is unaccusative, and the syntactic argument corresponding to δ in (97) is an internal DP-argument (which moves to SpecTP for nominative case):

(98)

```
                        vP
                      /    \
                     /      \
                    v        DP
                 change     /  \
                           /    \
                  the gas's temperature
```

Bringing together the analysis of *the gas's temperature* as a function on times in (94) and the analysis of change in (97), the derivation of the event predicate corresponding to *The gas's temperature changed* (= (76b)), ignoring tense, is given in (99).

(99)   a. $[_{\mathrm{DP}}$ the gas's temperature$] \rightsquigarrow \lambda t.\iota d(\mathrm{temperature}(t,\mathrm{g}) = d)$ (type $\langle e,e\rangle$)
       b. $[_{\mathrm{VP}} [_{\mathrm{V}}$ change$] [_{\mathrm{DP}}$ the gas's temperature$]] \rightsquigarrow$
            $[\lambda\delta\lambda e.\exists s(e\bowtie s \wedge \delta(\mathrm{beg}(\tau(e))) \neq \delta(\tau(s)))]$
               $(\lambda t.\iota d(\mathrm{temperature}(t,\mathrm{g}) = d)) =$ (by application)
            $\lambda e.\exists s(e\bowtie s \wedge$
            $\iota d(\mathrm{temperature}(\mathrm{beg}(\tau(e)),\mathrm{g}) = d) \neq \iota d'(\mathrm{temperature}(\tau(s),\mathrm{g}) = d'))$

This concludes our basic treatment of underspecified-scale verbs of change, which was another one of the three necessary conditions for transitive anticausatives (recall (88b)).
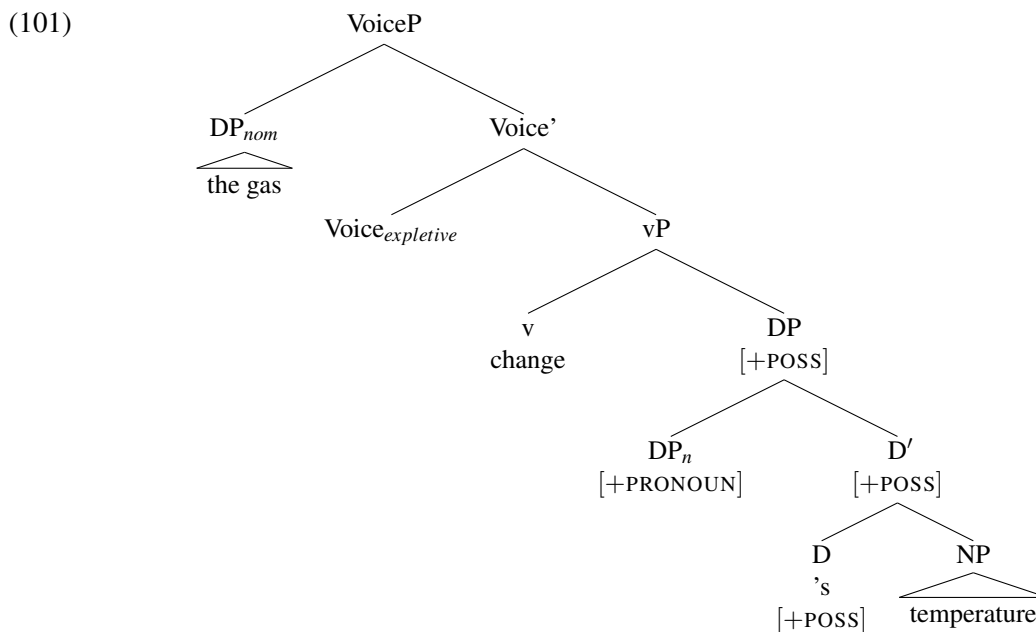
5.2.3   Transitive anticausatives

In this section, we show how transitive anticausatives are semantically equivalent to intransitive anticausatives but syntactically transitive, which is the challenge set out in section 5.1.
   Recall (89), repeated in (100).

(100)   [The gas]$_i$ changed its$_{i/*j}$ temperature.   (= (89); transitive anticausative)

The structure of transitive anticausatives is given below. Since transitive anticausatives are formally transitive (for example, they trigger *have*-selection in languages with aux-selection, while their canonical anticausative counterparts select *be*; see Schäfer (forthcoming) for data and additional arguments that these structures are formally transitive across languages), their structure must involve VoiceP hosting the external argument DP in its specifier. Furthermore, the internal argument DP involves a functional noun phrase with a possessive pronoun in it specifier.

(101)

```
                    VoiceP
                   /      \
              DP_nom      Voice'
              /           /    \
         the gas    Voice_expletive   vP
                                    /    \
                                   v      DP
                                change   [+POSS]
                                        /       \
                                    DP_n         D'
                                 [+PRONOUN]    [+POSS]
                                              /      \
                                             D        NP
                                            's    temperature
                                         [+POSS]
```

Turning to the interpretation of this structure, we need to explain 1) why the DP located in the canonical external argument position Spec,VoiceP is not interpreted as an agent or causer of the verbal event (as it would be in canonical lexical-causative uses), and 2) why the external argument DP obligatorily binds the possessive pronoun inside the internal argument DP.

Schäfer (forthcoming) argues that these two aspects are related. First, Voice is here neither agent Voice, nor causer Voice but *expletive* Voice (proposed for other purposes in e.g. Schäfer 2008; Wood 2015; Alexiadou et al. 2015). This functional head provides a specifier for an external argument DP to be merged, but does not enter any semantic relation with this DP. In particular, it does not assign any θ-role to it. Since Voice in (101) is expletive/semantically inert, this has the consequence that both the meaning of expletive Voice' and that of expletive VoiceP is identical to the meaning of the vP.

We now proceed step by step to the semantic derivation of transitive anticausative statements, starting with meaning the verb *change*. The semantic representation of *change* as a transitive anticausative is the same as the semantic representation of *change* in (97), repeated below.
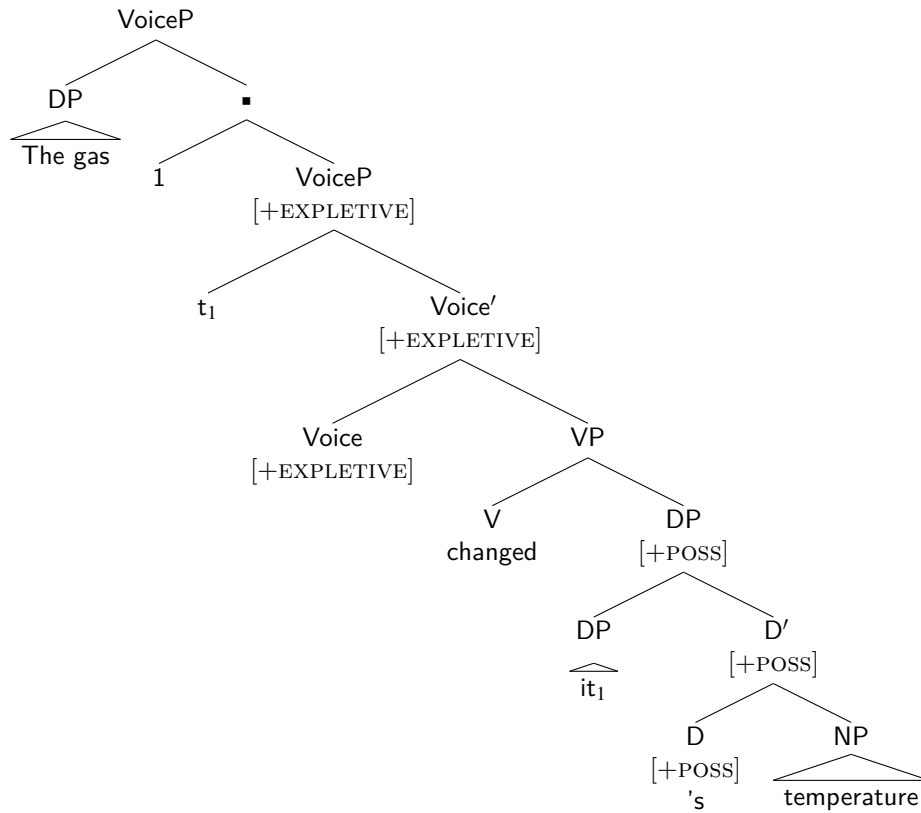
(102)   change $\rightsquigarrow \lambda\delta\lambda e.\exists s(e \bowtie s \wedge \delta(\mathsf{beg}(\tau(e))) \neq \delta(\tau(s)))$

Turning to the internal argument DP, the functional noun *temperature* comes with a possessive pronoun *its*, which later must be co-indexed with the external argument DP *the gas* (i.e., bound by it) in order for the transitive anticausative to be available. The index n carried by the possessive pronoun in (101) is a natural number. The meaning of *its₁ temperature* is composed as follows (cf. (99a)):

(103)   a. $[_{DP} \text{ it(s)}_1] \rightsquigarrow x_1$
        b. $[_{DP} [_{DP} \text{ it(s)}_1] [_{NP} \text{ temperature}]] \rightsquigarrow$
             $[\lambda x \lambda t.\iota d(\mathsf{temperature}(t,x) = d)](x_1) = $ (by application)
             $\lambda t.\iota d(\mathsf{temperature}(t,x_1) = d)$

Note that the index of the free variable representing the pronoun in (103a) is the same as the index of the pronoun (here: 1).

Applying the meaning of *change* to the meaning in (103b), we obtain the following meaning for the vP, ignoring tense (cf. (99b)):

Figure 2: Syntactic structure of transitive anticausatives

(104) $[_{VP} [_V \text{ change}] [_{DP} \text{ its}_1 \text{ temperature}]] \rightsquigarrow$
     $[\lambda\delta\lambda e.\exists s(e \bowtie s \wedge \delta(\text{beg}(\tau(e))) \neq \delta(\tau(s)))]$
       $(\lambda t.\iota d(\text{temperature}(t,x_1) = d)) =$ (by application)
     $\lambda e.\exists s(e \bowtie s \wedge$
     $\iota d(\text{temperature}(\text{beg}(\tau(e)),x_1) = d) \neq \iota d'(\text{temperature}(\tau(s),x_1) = d'))$

Recall that since expletive Voice is semantically inert, both expletive Voice$'$ and expletive VoiceP have the interpretation of the vP (which was given in (104)). This raises the question how the DP in the specifier of Voice can pass the theta criterion (Chomsky 1981)? As it turns out, this DP passes the theta criterion because it is interpreted as the possessor of the internal argument DP (recall that the transitive anticausative structure in (76c) and its canonical anticausative structures in (76b) entail each other). The only semantic effect at this Voice-level is then that the DP in the specifier of Voice binds the possessive pronoun inside the object DP, thereby acquiring the possessor role from the pronoun.

(105)   a.   VoiceP$[+\text{EXPLETIVE}] \rightsquigarrow$ (= (104))
        $\lambda e.\exists s(e \bowtie s \wedge$
           $\iota d(\text{temperature}(\text{beg}(\tau(e)),x_1) = d) \neq \iota d'(\text{temperature}(\tau(s),x_1) = d'))$
   b. $1 \rightsquigarrow \lambda x_1$
   c. $\bullet \rightsquigarrow$
        $\lambda x_1 \lambda e.\exists s(e \bowtie s \wedge$
           $\iota d(\text{temperature}(\text{beg}(\tau(e)),x_1) = d) \neq \iota d'(\text{temperature}(\tau(s),x_1) = d'))$
   d.   the gas $\rightsquigarrow$ g

e. VoiceP $\rightsquigarrow$
$$\lambda e.\exists s(e \bowtie s \wedge$$
$$\iota d(\text{temperature}(\text{beg}(\tau(e)), \text{g}) = d) \neq \iota d'(\text{temperature}(\tau(s), \text{g}) = d'))$$

Despite the significant syntactic difference between transitive anticausatives and intransitive anticausatives, they are semantically equivalent, which is illustrated by the fact that the event predicate in (105e) and the event predicate in (99b) (representing *The gas's temperature changed*) are identical.

If the subject DP does not bind the pronoun in the derivation in (101), the string *The gas changed its temperature* turns out ungrammatical, as the subject DP falls victim to the θ-criterion. The only way to rescue the string in the absence of binding is to resort to agent or causer Voice, which assigns an external argument role to the subject. This leads to a (pragmatically dispreferred) causative interpretation of the sentence.

5.3 Transitive anticausative vPs have inchoative semantics

We just have established that transitive anticausatives have the same truth-conditions as intransitive anticausatives, in line with Schäfer's (forthcoming) analysis. In the following, we corroborate this result by showing that tests used previously to detect the event properties of vPs confirm that the vP in transitive anticausatives has inchoative semantics (is interpreted as describing a mere change), just as the vP in canonical anticausatives. We look at progressive and *start/begin*-statements. We do so by contrasting the transitive anticausative construal with the causative construal built with an agent, since, by hypothesis, it is easier to use the vP to describe a full causation event (cause+effect) in the latter context. Furthermore, we focus on in-control agents, as it is much easier to see that the vP-event is bigger than just the change, since in their presence, it is possible to identify the beginning of the causation event before the change starts. It is difficult, however, to find sentences that can have both a transitive anticausative reading *and* a transitive causative reading with an animate agent. The reason for this is that in the presence of an animate agent, the transitive anticausative reading tends to be difficult to obtain because of the *agent bias* (or *agent preference*): we tend to preferentially interpret semantic role-ambiguous DPs such as human DPs as agents (Bickel et al. 2015, Sauppe et al. 2023). Thus, for instance, in (106), Ana can either be an agent (transitive causative construal), or a possessor (transitive anticausative construal), and the preferred interpretation for (106) certainly is the one under which Ana is the agent of her appearance change.

(106) Ana is changing her appearance.

Even with the help of contextual support, it seems difficult to enforce the transitive anticausative reading in the presence of the progressive morphology (needed for our first test). Thus for instance, in (107), the subject seems inexorably associated with the role of agent, despite the presence of the adjunct in principle favoring the anticausative construal.

(107) Under the influence of a very aggressive cancer Ana is changing her appearance.

It seems somewhat easier to obtain the transitive anticausative reading in the absence of a progressive and in a generic context (N.N, p.c.):

(108) a. Remember Ana right, all boys and girls had crushes on her in high school! Mind you...
            She changed her appearance over the last 70 years.
        b. As humans age, they change their appearance.

But we need the progressive for our first key test. To solve this problem, we turn to inanimate instrumental agents. Different from animate DPs, inanimate DPs are not subject to the agent bias, i.e., in strings where they are formally ambiguous with respect to their thematic role (here agent or possessor), they are are not automatically interpreted as agents.

Take (109b). The context in (109a) enforces the reading of the subject as an instrument in control of its behavior and fulfilling the intention of the agent using this instrument. In this context, sentence (109b)-(109c) are felicitous, although the targeted change (a decrease in temperature) has not been initiated yet. This shows that, as observed before, agentive causative statements allow the reading where the vP-event starts before the change itself starts.[26]

(109) a. Cassiel bought a new phone able to regulate its own temperature. When the temperature reaches a certain level, the telephone launches a cooling program, which typically starts being effective after 60 seconds. A second ago, Cassiel received the notification informing him that the telephone just started the cooling program, and says:
       b. My phone is decreasing its temperature.
       c. My phone started to decrease its temperature.

By contrast, when the inanimate instrumental DP is used in a context that invites the transitive anticausative interpretation, the same progressive or *begin-* statements entail that the change starts, in accordance with the hypothesis that the vP just denotes a mere change. For instance, (110b) and (110c) are not felicitous in the context (110a), making clear that the phone is not an (agentive) instrument (it cannot be a causer, as it is individual-denoting). The problem is due to the fact that it is not possible that the temperature of the phone changed so quickly, while such a change is required to be initiated for the sentence to be true, as the vP has inchoative semantics.

(110) a. Pauline has a very primitive pre-2000 phone. Her phone was very hot because of the sun exposure, so she put it in the shade a couple of seconds ago and uttered:
       b. #My phone is decreasing its temperature.
       c. #My phone started to decrease its temperature.

6   Conclusions

In this paper, we addressed a specific and pervasive type of syntax/semantics mismatch: except when the subject is an agent, change-of-state verbs used in *transitive* sentences tend to have '*intransitive*' (inchoative) semantics: they are typically used to describe just changes (BECOME events), just like when they are used in intransitive, antic sentences. By contrast, in the context of an agent, change-of-state verbs easily describe full causation events (cause+effect). We proposed to encode this variation in the use of transitive change-of-state sentences in the pragmatics. In the semantics, the relation between events in the denotation of the vP and the ensuing state is defined in purely temporal terms, via the 'abut' relation. Whether these events are interpreted as BECOME or CAUSE events is translated in the theory as a pragmatic enrichment.

Furthermore, we argued that it is only when they involve an in-control agent that causation events described by causative statements can be identifiable as ongoing before the change itself is ongoing. With out-of-control or inanimate agents, the full causation event denoted by the vP is typically understood as ongoing only once the change is ongoing, too, and caused by a (softly presupposed) covert event.

So why do in-control agents affect the use of change-of-state verbs the way they do and differ on this point from other types of external arguments? As discussed in section 4, we followed Martin's

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[26] Again, the observation extends to French, which does not have a futurate use of the progressive.

(2015) idea that the issue has to do with the fact that the agentive in-control behavior offers an objective way to identify the left boundary of a full causation event, and we would like to elaborate this point a bit more. Intuitively, the cognitive representation of an event chain made of a cause and an effect is 'more cohesive' when performed by an in-control agent. In-control actions and their intended effect (e.g. in-control openings of closed objects) are stored in the memory in 'action scripts', and associated with a typicality structure (see e.g. Hanson & Hanson 2005 and references therein), cognitive frames (see e.g. Fillmore 1969; 1982) or temporal patterns of forces (Gärdenfors & Warglien 2012). These patterns are so deeply rooted in our cognitive structures that the kinematics of a movement often contains enough information to identify the underlying action script, as nicely shown by Johansson (1973) with experiments using the patch-light technique (see Gardenfors 2014). Relatedly, an action easily 'goes proxy' for the intended outcome: its structure indicates by itself what the intended outcome is; think of the evocative power of pantomimes (Martin 2015). We speculate that considerations along this line account for why change-of-state verbs are often used to describe events containing actions that can start before the intended outcome in the context of in-control agents or instruments.

Out-of-control actions do not seem cognitively packaged the same way. Accidental episodes seem to inherently have a *bipartite* conceptual structure: some entity is involved in a *first* event, and an unplanned or unexpected *second* event follows (think also of the Latin meaning of *accidens*: accidental part of a cause). It seems rather implausible that events and their accidental consequences get conceived as being packaged together as 'one conceptual thing', a single action script associated with a typicality structure. Rather, an out-of-control action is usually understood as caused by another event, and often identified only *post-facto*, once the outcome is triggered. We speculate that this contributes to explain why often, in the context of an out-of-control agent, change-of-state verbs are used to describe causation events made visible to us 'through the lens' of the change they cause.

A last point worth mentioning is the obvious link between the inchoative hypothesis explored in this paper and Demirdache & Martin's (2015) Agent Control Hypothesis (ACH). The latter says that across languages, zero-change readings of change-of-state verbs tend to require the subject's referent to be associated with agentive properties (recall the 'wake up' agentive vs. non-agentive examples (18)). The inchoative hypothesis captures the generalization that change-of-state verbs tend to describe just changes, *except* in the presence of an agent subject, in the context of which they can easily describe actions followed by their result. The ACH directly derives from the inchoative hypothesis under the assumption that zero-change readings obtain when the sentence describes a part of an event in the extension of the vP via the partitive semantics of the aspectual morphology used (such as the progressive, or the perfective in South Asian languages like Thai, Hindi or Mandarin as analysed by Koenig & Muansuwan 2000 or Altshuler 2014). It suffices that the imperfective morphology returns a part of some event in the extension of the vP which does not involve any change. This is obviously not possible when the vP is used to describe just the change.

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