The Case for an Anchored CAUSE

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Abstract

In this paper I propose the meta-predicate CAUSE can be reduced to a circumstantial modal assuming an anchor semantics. To show this I focus on the semantics of strong overt causative expressions, in English, e.g., *made, forced, got*, and propose they are circumstantial modals with a syntactically explicit modal anchor. This proposal endorses a semantics in which modal components are independently provided by syntax, straightforwardly predicts the distinction between strong and weak overt causatives, eliminates vagueness from our semantic terminology, and accounts for the close relation between linguistic expressions that have received independent treatments in the literature.

1 Introduction

This paper introduces a project that explores the linking of syntax and semantics as a way to construct building blocks of modal meaning. Here I focus on strong overt causatives as they relate to circumstantial modal auxiliaries shown in (1).

(1) a. Jane made George go to the store. b. George had to go to the store.

The goal is to have a way of building causation in the syntax, which is not by any means a novel goal, but done in a way that relates modals and causatives explicitly in a framework that appreciates their syntactic and semantic similarity. From this proposal we predict the close relationship shared between the two expressions with regards to meaning, morphology, and processing, which is not straightforwardly achieved by assuming a meta-predicate CAUSE. Such a decomposed analysis of causation allows us to express causal relations uniformly as circumstantial modality and links differences in meaning to the difference between smaller and larger modals each with varying modal components. In Section 2 I present semantic properties of overt causatives and emphasize how their external argument contributes to their meaning. In Section 3 I highlight various similarities between overt causatives and circumstantial modals and present the basics of anchor semantics. It is also in this section that I extend anchor semantics to overt causatives and describe its advantages and predictions. Lastly, in Section 4 I discuss open questions which are the focus of ongoing and future work.

2 Overt Causatives

In English, overt causatives are verbs such as, *make, have, cause, force, get.*[1]

(2) Jane *made/had/caused/forced/got* George (to) go to the store.

In the classic analysis, overt causatives are analyzed as relating two events[2] in which the causer event is somehow responsible for bringing about the caused event. This causal relation

[1] Overt causatives have also been called 'periphrastic causatives' in the literature.

[2] The kind of relata that stand in a causal relation varies in the literature (e.g., events, situations, individuals, etc.). For an overview of proposals that differ in terms of causal relata see Bar-Asher Siegal and Boneh (2020).

is often evoked in the literature by the meta-predicate CAUSE, where 'e_1CAUSE e_2' refers to the relation whereby the event e_1 somehow brought about event e_2 (Dowty 1979; Levin and Rappaport Hovav 1995; Kratzer 2005; Pylkkänen 2000; Pylkkänen 2008, a.o.). CAUSE is generally understood to describe a counterfactual relation between the two events, following Lewis (1973), however, there have been arguments against CAUSE denoting counterfactual causation (Copley and Harley 2015; Copley, Wolff, and Shepard 2015; Talmy 1988; Wolff and Song 2003; Wolff 2007). A uniform analysis of overt causatives is challenging since there seems to be considerable variation with respect to ways in which the caused event is brought about by the causer event.

2.1 Flavor Variation

In the literature it's been reported that the ways in which a caused event is understood to come about varies (Lauer 2010; Luo 2024; Nadathur and Lauer 2020). I propose to classify these observations along three dimensions for organizational purposes. These dimensions can be considered kinds of causal "flavors," which are not meant to be exclusive. In fact, depending on the overt causative's subject, multiple flavors may be available.

A caused event can come about as the result of persuasion/ordering. For example, sentence (1-a) is true in a context in which Jane convinced, ordered, or pushed George to go to the store. However, a caused event can also come about by means of natural laws, such as in the *made*-sentence below.

(3) The flowers made Jane sneeze.

Sentence (3) is true in a context in which someone put roses on the table in front of extremely allergic Jane, the particles of which entered through her nose sparking a reaction. Additionally, overt causatives can also denote an instrumental use of its subject. Sentence (3) is true in a context in which miserable George, seeking any excuse to leave the party, tried to trigger an allergic reaction in Jane by putting the roses directly in front of her. In this context, the flowers are used as an instrument to achieve some goal. This instrumental interpretation holds of other overt causative forms, such as *got*.

(4) The drink got Jane to dance at the party.

This sentence is true in a context in which a drink has intentions and pulls Jane onto the dance floor (think: an adult cartoon), or one in which a drink was used as an instrument to achieve some goal, maybe by a friend to get miserable Jane dancing at the party. Again, the natural law interpretation is also available as was the case with the previous example.

Discussions concerning these different causal flavors (persuasion/ordering, natural laws, instrument/goal), have remained rather isolated in the literature. I would like to emphasize that the availability of a given flavor seems to be determined by the kind of external argument a overt causative takes. For example, an overt causative sentence with an animate external argument can be true in a context that involves persuasion or ordering (sentence (1-a)), whereas overt causative sentences with an inanimate external argument can be true in contexts in which natural laws are highlighted (sentence (3)) or the external argument is understood to be an instrument for an implicit goal (sentences (3) and (4)). It would be advantageous to have a semantics of overt causatives in which the subject and its properties derive the available causal flavors, thereby avoiding polysemous analyses of flavor variation.

2.2 Form Variation

It's known that overt causative forms have different lexical semantic restrictions (Baglini and Bar-Asher Siegal 2019; Copley, Wolff, and Shepard 2015; Doron 1999; Eckardt 2000; Maienborn

and Herdtfelder 2017; Nadathur and Lauer 2020; Neeleman and Van de Koot 2012; Reinhart 2002). For example, *got* requires animate external arguments with goals; if it lacks one, an instrumental interpretation is conveyed,

(5) George/The flowers got Jane to sneeze.

Had is also restricted to an animate subject with a goal. However, unlike *got*, an instrumental interpretation is not available.

(6) George/The drink had Jane entertain the guests.

The sentence with *the drink* as subject is only true in a context in which the drink is personified (again, think: adult cartoon). The reading where the drink is used as an instrument for a goal is not available as it was with *got* in sentence (4). Compare these to *forced*, which merely requires some resistance on the part of the argument in the caused event. Sentence (7-b) is true only if Jane is at least somewhat reluctant to cycle to Zandvoort.

(7) a. George/The wind forced the windows open.
b. George forced Jane to cycle to Zandvoort.

In this section I've shown that overt causatives come in a variety of flavors, and that they vary in terms of their lexical semantic restrictions. However, what I hope to have clearly demonstrated is that the subject puts restrictions on available flavors, and that lexicalization distinctions may reflect this subject/flavor landscape. A bi-eventive analysis, such as the one that makes use of CAUSE, does not straightforwardly offer insight into why the properties of the subject affect the available "flavors" of the causative. If we assume overt causatives are modals, an anchor-semantics analysis would provide a way to derive modal properties directly from the modal's arguments. I motivate this decision by highlighting several similarities between overt causatives and circumstantial modals. The main idea is that if we assume that overt causatives are circumstantial modals, then we can use the notion of modal anchors to build causation into the syntax just as we have used them to construct modal meanings in the syntax.

3 Overt Causatives as Circumstantial Modals

The link between modality and causatives is well-established in the literature (Ilič 2014; Koenig and Davis 2001; Martin and Schäfer 2012; Martin and Schäfer 2017; Palucci 2023; Privoznov 2023, a.o.). In a classic proposal for modality, circumstantial modals quantify over accessible possible situations projected from their modal base and embed a proposition that is true in the actual world (Kratzer 1977; Kratzer 1981; Kratzer 1991). More recently, circumstantial modals have been understood as the expressions we use when we engage in actuality-directed modal thought, i.e., the various ways we figure out what the actual world is like by considering and evaluating possible extensions of an accessible part of it (Phillips and Kratzer 2024).

We find that there are many similarities between circumstantial modal expressions and overt causatives. This isn't surprising given that both expressions refer to some set of facts in the actual world that necessitates the truth of a proposition. Similar to (circumstantial) modals, overt causatives vary in terms of force. There are strong overt causatives such as, *made, cause, forced,* and weak overt causatives such as *enable* and *let* (Wolff, Song, and Driscoll 2002; Wolff and Song 2003; Wolff 2007), and as is the case with modals this difference in force leads to entailment relations whereby strong overt causative sentences asymmetrically entail their weaker counterparts. There is the observation that some overt causative sentences asymmetrically entail circumstantial modal sentences. For example, sentence (1-b) is true in all the situations in which sentence (1-a) is true, though further work in required in order to determine if this observation

generalizes to other overt causative sentences with respect to their circumstantial modal auxiliary counterparts. Moreover, cross-linguistically we find linguistic expressions that are used to denote both circumstantial and overt causative meaning. For example, Privoznov (2023) argues that in Balkar the suffix *-al* is used to mark deontic, circumstantial, and causal necessity, and we find Mandarin's *yao* can be used for both circumstantial and causal necessity.

(8) a. George yao Jane mai qiaokeli
George **yao** Jane buy chocolate
'George made Jane buy chocolate.'

b. Jane yao mai qiaokeli
Jane **yao** buy chocolate
'Jane needed to buy chocolate.'

There is also psycholinguistic evidence that overt causative *made* primes the production of circumstantial modal *had to*, suggesting that the two are processed similarly and may share abstract representations which are accessed during priming (Hill and Momma 2024). Taken together, it is clear that overt causatives and circumstantial modals have some shared core. In the next section I review anchor semantics as it was proposed in Kratzer (2013) and Phillips and Kratzer (2024), and then explore extensions to the analysis of overt causative and reconstruct their interpretation as circumstantial modals with a syntactically explicit modal anchor.

3.1 Anchor Semantics for Modals

Modal predicates, such as *be fragile*, have been used to motivate the shift from a modal semantics in which a modal's domain of quantification is projected from its modal base, i.e., a set of contextually provided propositions, to an anchor semantics in which a modal's domain of quantification is projected from the modal's argument, e.g., an individual or an individual and its circumstances. To appreciate this shift, consider sentences below, originally presented in Lewis (1997), and discussed in Kratzer (2013) and Phillips and Kratzer (2024).

(9) a. The glass is fragile.
b. The glass can break easily.

On the face of it, the two sentences seem to mean more or less the same thing and are more or less interchangeable. However, we can find a context in which one is true and the other isn't (necessarily) true: the context of the diligent Sorcerer, introduced by Lewis.

> "A sorcerer takes a liking to a fragile glass...He does nothing at all to change the dispositional character of his glass. He only watches and waits, resolved that if ever his glass is struck, then, quick as a flash, he will cast a spell that changes the glass, renders it no longer fragile, and thereby aborts the process of breaking."
>
> Lewis (1997, p.147)

The general intuition[3] is that sentence (9-a) is true in the Sorcerer context, but sentence (9-b) doesn't have to be because there is an interpretation of the sentence in which although being-fragile is an intrinsic property of being a glass, the fragile glass will never break so long as the Sorcerer is present. That is, depending on how much of the situation is kept stable across the domain of quantification (i.e., just the glass, or the glass together with the fact that there is the diligent Sorcerer present), one could judge sentence (9-b) as either true or false.

Appealing to an anchor semantics allows us to link the syntactic differences between modals to explain semantic differences between modals in a way that a classic analysis which relies on

[3]I say "general intuition" because judgments about these sentences are not unanimous. For example, some speakers prefer different tense on the modal auxiliary (e.g., *The glass could break easily*). Though these observations deserve further investigation, they don't directly affect the argument of this paper, which only relies on there being a truth conditional distinction between the modal predicate and the modal auxiliary.

modal bases for domain projection, doesn't. Kratzer (2013) and Phillips and Kratzer (2024) propose an anchor semantics for modal predicates and modal auxiliaries, though the idea of a modal anchor is traced back to Arregui (2005), Arregui (2007), Arregui (2009), and Hacquard (2006). The framework requires richer formal models than possible worlds, and so makes use of possible situations, which are linked by mereological part-of relations where worlds are assumed to be maximal situations. (see Kratzer (2021) for an overview of situation semantics for natural language). In the framework, a modal's domain of quantification is anchored to and therefore projected from its argument (the Modal Anchor Hypothesis (Kratzer 2013; Phillips and Kratzer 2024)). The denotation for (9-b) is the following,

(10) $[\![\textbf{The glass can break easily}]\!]^{f,s_0} = \exists w \in f_{fact}(s_0) \wedge N(w) \wedge \exists s'[s' \leq w \wedge \textsc{match}(s_0, s') \wedge$ the glass breaks easily in $s']$

f_{fact} is the function responsible for factual domain projection – it creates a domain for which every modal alternative has a counterpart to the anchor given by the topic situation; $N(w_i)$ refers to normality restrictions which govern world w_i (e.g., natural laws, stereotypical behavior); $\leq$ denotes the part-of relation between situations where worlds are maximal situations; and $\textsc{match}(s_i, s_n)$ maps similarity relations between situations via counterparts (Lewis 1986). Sentence (9-b) is true if and only if there is a normal world in the factual domain projection of the topic situation s_0, such that there exists an accessible possible situation in which there is a counterpart of the topic situation and the glass breaks in that accessible possible situation. The truth conditions for sentence (9-a) will be identical to those in (10), except instead of the topic situation as the modal anchor, a time-slice of the subject, i.e., the glass at the topic situation will be the anchor. Using modal anchors allows us to account for the truth conditional difference between sentences (9-a) and (9-b) since there is flexibility with respect to the anchor situation. For (9-b), if we take the topic situation as containing the Sorcerer, the sentence will come out false, if we restrict the topic situation to just the glass, the sentence is true. With sentence (9-a), the anchor situation is restricted to just the glass, which means so long as the accessible counterpart situation matches the time-slice of the glass in the topic situation the sentence is true, even if there is also a diligent Sorcerer, it's raining outside, the glass is on the table, etc.

3.2 Anchor Semantics for Causatives

I propose that overt causatives are the phonological spell-out of a circumstantial modal with a syntactically explicit modal anchor. Consider the LF and truth conditions for sentence (1-b). The embedded clause introduces a situation argument, λs_1, which eventually will co-refer with the topic situation, s_0.

(11) a. [**had to** λs_1 [**George** [**go-store**]]]
b. $[\![(1\text{-b})]\!]^{f,s_0} = \forall w \in f_{fact}(s_0) \wedge N(w) \wedge \exists s'[s' \leq w \wedge \textsc{match}(s_0, s') \wedge$ George goes to the store in $s']$

The truth conditions for the overt causative sentence (1-a) will be identical to those for (1-b) except the anchor situation will be a past time-slice of Jane picked out by the topic situation, which can include her desires, her commands, any actions she's doing, etc.

(12) a. [**Jane**$_{s_1}$ **made** λs_1 [**George** [**go-store**]]]
b. $[\![(1\text{-a})]\!]^{f,s_0} = \forall w \in f_{fact}(\text{Jane}_{s_0}) \wedge N(w) \wedge \exists s'[s' \leq w \wedge \textsc{match}(\text{Jane}_{s_0}, s') \wedge$ George goes to the store in $s']$

Sentence (1-a) is true if and only if in all possible normal worlds in the factual domain projection of Jane as picked out by the topic situation (which can include laws such as George's tendency to

obey Jane's wishes), there exists a possible situation in which there is an accessible counterpart of that time-slice of Jane and in that possible situation George goes to the store. Intuitively, the meaning of a strong overt causative sentence is that given whatever facts pertain to the causative's subject in the topic situation, they are responsible for the argument of the resultant situation having to do something and actually doing it. This follows straightforwardly from the semantics since *made* universally quantifies over worlds in which there is a situation that matches the anchor situation in the actual world, meaning that the proposition, *George goes to the store,* will necessarily be true in the actual world.

There are a number of consequences and predictions that follow from this proposal. One result, which isn't unique to this proposal but any quantificational modal account of overt causatives, is that we can attribute the force difference between strong and weak overt causatives to the difference in modal necessity and possibility. An advantage of anchors is that the kind of external argument the causative takes will affect the kind of facts that hold in the topic situation and thus the kind of relation that holds between the anchor and resultant situation. Furthermore, since overt causatives are analyzed as essentially circumstantial modal auxiliaries with something extra, run-of-the-mill circumstantial modals such as *had to*, which always have an implicit modal anchor, will also always have an implicit cause. This seems to be true. Out of the blue, *George had to go to the store*, because of something, be it his hunger, or Jane's desire, etc. Moreover, given this consequence we predict that circumstantial modals such as *had to* should also be sensitive to the same kind of causal flavors available to overt causatives. Again, this seems to be the case. *The vase had to fall,* can be true according to natural physical laws. For example, given the angle and force of Jane's elbow with respect to the weight and stability of the vase, there was no way the vase couldn't have fallen, but a persuasion/ordering relation is only available if we consider a contrived, personified, context. Lastly, given the shared structure that results from overt causatives containing a circumstantial modal core, we predict that cross-linguistically there will be overlap between morphology that is used to denote circumstantial, and therefore causal, necessity, which seems to be the case in Balkar. Moreover, we predict that it's possible for a language to use the same lexical entry, such as Mandarin's *yao*, to convey circumstantial modality either with an explicit modal anchor or not.

4 Towards a Complete Framework

I've sketched out a way to extend a proposal that ties modal interpretations to the syntax-semantics interface in the case of overt causatives. This proposal makes claims about the "building blocks" of causative meanings in line with the building blocks of modal interpretations. The extension accounts for the cross-linguistic, semantic, and processing similarities between causatives and circumstantial modals. A main selling-point of anchor semantics is the role the syntax-semantics interface plays in providing modal components, yet as it currently stands it's unclear how this interface unfolds. For example, how does the denotation for modal predicates compose with structure such as Voice and Aspect? Or how exactly are anchors composed, i.e., how do we construct a time-slice of the external argument? How can we integrate features such as animacy into our derivations? How do the arguments of embedded clauses also affect available flavors as is the case with, *The vase had to fall*? Accounting for the interface is crucial for then extending the framework to overt causatives. Yet there are still loose ends even with the proposal as I've sketched it here. I point out that the fact that overt causative sentences entail actuality follows directly from the fact we are universally quantifying of counterparts of the actual world, meaning the actual world will necessarily be included in that set. Of course, if overt causatives and circumstantial modals share similar truth conditions, a question remains as to why circumstantial necessity modal auxiliaries such as *had to* do not entail actuality. These open questions and (not so small) details are the focus of ongoing and future work.

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