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Lexical content and context: The causative alternation in English revisited

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Abstract

This paper supports an analysis of the causative alternation in English in which all alternating verbs are lexically associated only with the internal argument(s). Lexical and contextual constraints on the distribution of the variants are distinguished. Semantic constraints on what kinds of causes appear with which verbs in various uses are argued not to be lexically specified. The account distinguishes clearly between the principled availability of the two variants of a causative alternation verb and the principles governing the (non)expression of the external cause. Many of the nonlexical constraints on the causative alternation are best understood as resulting from principles which determine which variant of the alternation is most appropriate in a given discourse context.

Keywords: Causative alternation; Internal and external causation; Lexical adicity; Direct causation; Change of state verbs

1. Introduction

The causative alternation in English, illustrated in (1) below, is extremely productive. Levin (1993) lists well over 200 verbs that participate in the alternation, and new verbs that enter the language participate in the alternation as well.

(1) a. John broke the vase.
b. The vase broke.
(2) a. The butler opened the door.
b. The door opened.

Nonetheless, the alternation is also constrained. There are two broadly defined kinds of constraints. First, there are verbs which appear to be of the appropriate semantic type to alternate, but do not alternate. For example, given a characterization of the class of alternating verbs commonly offered and to be discussed in section 3, at least some verbs of killing and destruction should undergo the alternation. However, in English, all verbs of these classes systematically resist the alternation[1] (Levin, 1993; see also Alexiadou, 2010; Alexiadou et al., 2006; henceforth AAS):

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[1] The exact scope of the alternation is a matter of debate. For example, the question of whether the alternation which some verbs of emission show (*I rang the doorbell/The doorbell rang*) should be considered a manifestation of the causative alternation is not settled. See Levin and Rappaport Hovav (1995), Levin et al. (1997), Rappaport Hovav and Levin (2012) and Potashnik (2012) for differing views. In this paper, I restrict my attention to change of state verbs, which is the core class of alternating verbs cross-linguistically.

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(3) English verbs of destruction: *demolish, destroy, devastate, exterminate, obliterate, raze, ruin, wreck*...
(4) English verbs of killing[2]: *kill, eliminate*, ...
(5) a. *The city destroyed.
b. *The building demolished.
c. *The toys ruined in the rain.
(6) a. *The rebels all eliminated.
b. *All the chickens killed.

Second, as discussed in Levin and Rappaport Hovav (1995, henceforth L&RH 1995; see also AAS 2006) there are verbs which in principle alternate, but for certain choices of arguments appear not to alternate, as illustrated for the verb *clear* below. (7) indicates that the verb participates in the alternation, and (8) shows the apparent unavailability of the anticausative[3] variant for one particular choice of theme argument.[4]

(7) a. I cleared the screen.
b. The screen cleared.
(8) a. The waiters cleared the counter.
b. *The counter cleared.

Much less discussed are cases of causative alternation verbs which for certain choices of theme argument, the *transitive* variant appears to be absent (Rappaport Hovav and Levin, 2012 (henceforth RH&L 2012); see also Folli, 2003 and Ramchand, 2008):

(9) a. Her face narrows under the cheekbones.
b. ????Her bone structure narrows her face under the cheekbones.
(10) a. My watch broke after the warranty ran out.
b. *I broke my watch after the warranty ran out (does not have the same interpretation as (a)).
(11) a. As the days lengthened into weeks, their food and water was almost gone.[5]
http://www.stepstolife.org/php/view_article.php?article_id=374
b. *As the wait lengthened the days into weeks...

The challenge is then to provide an analysis of the alternation which will account both for its productivity and for the constraints on its distribution. Most accounts to date have focused on the lexical properties of verbs which alternate: they address the question of the basic adicity of alternating verbs and the question of the appropriate semantic characterization of alternating verbs either in terms of the semantic roles of the arguments or in terms of a semantic classification of predicates. With respect to these questions, there are broadly speaking two kinds of accounts.

One class of accounts claims that the alternating verbs are lexically associated with two arguments and the alternation arises from the removal (or nonexpression) of the external argument. These accounts have generally assumed that the constraints on the alternation involve the lexically specified nature of the argument removed (or not expressed) in the derivation of the anticausative variant. The other class of accounts claims that alternating verbs are lexically associated with only one argument and the alternation arises from the addition of a cause argument. While these accounts imply that there are both lexical and nonlexical factors which determine the appearance of the cause argument, it is usually only lexical factors which are explored, and I know of no study which attempts to systematically formulate the nonlexical factors governing the alternation, let alone studies which distinguish explicitly between lexical and nonlexical factors.

[3] I use the term 'anticausative' to refer to the intransitive form of a verb which participates in the causative alternation, and sometimes to a sentence using this verb form. In the literature, the term is sometimes reserved for the intransitive member of a causative alternation pair that is morphologically marked (e.g., Haspelmath, 1993). This use of the term is clearly not relevant for English which doesn't mark the alternation morphologically.

[4] I say that the alternation is *apparently* unavailable for this choice of theme, since, as I will show below, the verb does in fact alternate with this choice of theme, but much depends on context.

[2] It is unclear to me whether any other verbs of killing are relevant here. Most other verbs of killing appear to require an animate external argument, which is not true for alternating verbs in general (see Levin, 1993:231). It may even be that the verb *kill* is the only relevant example here.

[5] This sentence does not mean that the length of the day increased, but rather that the length of the units for marking the passage of time in the context under consideration increased from days to weeks. See Deo et al. (2013) for a semantic analysis of verbs of change of state which can possibly accommodate this sense of the verb *lengthen*.

There is another question which has received almost no attention in accounts of the causative alternation. Given the principled availability of both the transitive and anticausative variants of a verb, it remains to be determined which variant is most appropriate for the description of a change of state event in a given discourse situation. This question is raised along with some observations and comments in McCawley (1978; see below section 4); however, I know of no other studies which pursue this question in depth. This lacuna is somewhat surprising, since the study of the discourse contexts which determine choice of variant has proven a rich topic of research for other argument alternations, in particular, the dative alternation and the passive. I suggest, however, that the answer to this question is the basis for accounting for the second kind of constraint mentioned above.

In this paper, I first provide further systematic evidence against analyses which assume that alternating verbs are lexically associated with two arguments and in support of the view that in English all alternating verbs are lexically associated with the internal argument(s) only.[6] The cause argument, then, is introduced non-lexically. I do not deal in this paper with the mechanics of the introduction of the cause argument, but rather the factors which determine the semantic type of DP that is appropriate as the cause argument in specific cases, and the factors which determine the appropriateness of the (non)expression of the cause argument in a given context. I suggest that both lexical and nonlexical factors are involved in both these issues. In an attempt to systematically distinguish the lexical from the nonlexical factors, I argue against the relevance of the commonly appealed to lexical distinction between verbs of internal causation and verbs of external causation (L&RH 1995) to the determination of the (non)appearance of the external argument. I suggest instead that discourse principles are prominent among these factors and that once the discourse principles governing the expression or non-expression of the external argument are fleshed out, there is no longer a need to appeal to a lexical distinction of internal/external causation. Though a complete account of the discourse principles at work is beyond the scope of this paper, a preliminary account is provided. This is shown to account for a wider range of data than current analyses.

The paper is organized as follows. In section 2, I review the first of the two classes of approaches to the question of the lexical characterization of the class of alternating verbs, most fully developed in Levin and Rappaport Hovav (1995) and Reinhart (2002, in press); (see also Chierchia, 2004; Grimshaw, 1982; Horvath and Siloni, 2011a; Koontz-Garboden, 2009; Reinhart and Siloni, 2005). This approach assumes that all alternating verbs are inherently dyadic, selecting a cause argument and an argument representing an entity which undergoes the specified change – the theme argument. A lexical rule is responsible for removing the cause argument in the derivation of the anticausative form of the verb.[7] I refer to these approaches collectively as 'transitive base' approaches (Schäfer, 2009), despite the fact that there are significant differences between the analyses. Common to these approaches is that the main constraint on the alternation derives from the lexical characterization of the cause argument, though L&RH (1995:104–105) do hint at non-lexical factors which constrain the alternation. In section 3, I discuss the shortcomings of this approach by showing that the constraints formulated do not appropriately capture the generalizations concerning the distribution of the alternation, and that contextual factors play a significant role. Some of the argumentation is based on the discussion in Rappaport Hovav and Levin (2012).

The second approach, reviewed in section 4, does not assume a lexical derivational relation between the two variants of the alternating verbs. On this approach, represented by Alexiadou (2010), AAS (2006), Alexiadou and Doron (2012), Harley (2008), RH&L (2012) (see also Doron, 2003),[8] alternating verbs are lexically associated only with the internal argument(s). The external argument is introduced non-lexically. These approaches share the assumption that the constraints on the alternation follow from the lexical classification of the root of the verb together with non-lexical factors, and that a distinction between verbs describing internally caused events and those describing externally caused events is central among the lexical factors. I argue against this lexical distinction. Instead, I suggest that the only lexical distinctions that are necessary involve semantic restrictions on particular arguments and the number of arguments that a verb selects. In section 5, I explore the contextual factors governing the alternation. Section 5.1 suggests that the well-known constraint that lexical causatives express direct causation contributes to the determination of the semantic type of DPs allowed as

[6] I deal only with English in this paper, though of course a full account of the causative alternation should be applicable to other languages as well. I assume that the roots of alternating verbs have the same properties in other languages as well. However, in some languages anticausative verb – as opposed to the root – may have additional arguments associated with it as a result of morphology. In English, which lacks any morphological marking on either variant, I assume that the anticausative verb is similar to the root in being associated only with the internal argument(s).

[7] Although the approach of both Chierchia (2004) and Koontz-Garboden (2009) are transitive based, they provide a different – reflexivization – account of what happens to the external argument in the derivation of the anticausative variant. Thus, these accounts, similar to the account in LRH, but unlike the account in Reinhart, assume some kind of causative structure or semantics for anticausative verbs. The approach advocated here is most compatible with the view that anticausatives do not have causative semantics. See Rákosi (2012) for additional discussion of this issue.

[8] Piñón (2001) offers what he calls a ''Y" model approach in which both the transitive and intransitive variants are derived from what he calls a common ''stem", but his analysis is still cast in lexical terms.

the external argument in given contexts. Section 5.2 deals with the question of which variant is appropriate in a given discourse context. Since there is a choice between describing a situation either with or without an argument expressing the cause of the change of state, and there is an entailment relation between the two options, familiar Gricean principles of conversation are involved in the choice. Since the causative variant is more informative, if the expression of the cause is deemed relevant, it will be preferred in most cases. The anticausative is licensed either if the cause is recoverable in some way or if the speaker does not know what the cause is. This account is shown to cover constraints on the alternation which have been taken to be lexical and also those which are more clearly nonlexical.

2. Motivations for the transitive base analysis

In this section I discuss two types of arguments which serve to motivate the transitive base analyses of L&RH (1995) and Reinhart (2002, in press), which I take as representative of the class of transitive base approaches.[9]

According to both L&RH and Reinhart, it is possible to characterize the class of verbs which participate in the causative alternation only on a dyadic base. L&RH propose that the crucial lexical semantic distinction for characterizing the class of alternating verbs is between verbs denoting internally caused events and those denoting externally caused events.[10] Verbs denoting internally caused events are lexically monadic, selecting only the argument denoting the entity undergoing the change specified by the verb, and verbs denoting externally caused events are lexically dyadic, selecting in addition a cause argument. A subset of verbs denoting externally caused events, namely those which do not specify anything about the event which brings about the lexically specified change, undergo a process of lexical binding[11] of the external argument, preventing the external argument from being expressed syntactically, thereby resulting in the anticausative variant of the alternation.

To illustrate, a verb such as *bloom* names an internally caused event, and is therefore lexically monadic; consequently it has an anticausative, but not a transitive, variant.

(12) a. Flowers bloomed.
b. *The gardener bloomed the flowers

In contrast, the verbs *murder* and *break* both describe externally caused events, and hence, have a transitive variant. However, since *murder* specifies something about the causing event (it must involve intention), this verb cannot undergo lexical binding, and does not participate in the alternation. In contrast, a verb like *break*, specifies nothing about the causing event, and can undergo the process of lexical binding. In addition to participation in the alternation, a reflection of this lexical distinction between *break* and *murder* is that *break* allows DPs bearing a range of roles to appear as subject (13a), while *murder* only allows agents (13b). Since *break* does not specify the nature of the involvement of the cause argument, any argument that can conceivably be construed as a cause is acceptable.

(13) a. The vandals/the rocks/the storm broke the windows. (L&RH 1995:103)
b. The hit men/*the bullets/*the plan murdered the gangster.

The claim then is that the class of verbs undergoing the alternation can be succinctly characterized over the transitive variant of the alternation: verbs describing externally caused events which specify nothing about the causing subevent.

[9] There is a third motivation discussed in L&RH (1995) and in Chierchia (2004), namely, the pattern of morphological marking in the alternation. This has been criticized in numerous studies which show that the morphological patterns are more variable than one would expect if this is indeed an indication of direction of derivation. Koontz-Garboden (2009) makes the more modest assumption that the reflexivization account is appropriate only for those languages which show a consistent pattern of morphological marking on the intransitive variant (which is also homophonous with reflexive morphology).

[10] In L&RH's account, it is not strictly events which are classified as internally or externally caused, but rather construals of events, represented by the lexical semantics of verbs. In principle, the same event in the world can be described using a verb of internal causation or a verb of external causation. For example, they take the verb *shake* to be a verb of external causation, as it participates in the alternation, and the verb *shiver* to be a verb of internal causation, as it does not participate in the alternation. Note, however, that an event of a person shivering can be described using either verb and it does not seem to make sense to classify *shake* as a verb of external causation in this case. The position I take in this paper is that it is more appropriate to talk about descriptions of events as indicating or not indicating a cause (similar to the way in which the distinction in telicity is ascribed to descriptions of events). One of the points to be made in this paper, is that verbs are more versatile (though not completely) in their ability to participate in different kinds of event descriptions than normally assumed. It remains to be determined what the factors are which allow, encourage or demand that a change of state in the world be described with mention of a cause. This is discussed further in section 4.

[11] Lexical binding is to be distinguished from existential binding posited for indefinite object omission verbs and for the external argument of passives. L&RH (1995:108) suggest that lexical binding binds the argument at a 'pre-syntactic' level of LCS, while existential binding in the other cases operates on the syntactically relevant level of AS (=argument structure). I do not discuss this aspect of the analysis further, since the position in this paper is that the anticausative is associated only with one argument.

Reinhart's (2002, in press) characterization of the class of alternating verbs is similar. She assumes that the class of alternating verbs is defined in terms of thematic role labels of the transitive variant (where these are given a feature decomposition). The class of alternating verbs is defined as in (14).[12]

(14) V ([+c] (=underspecified cause), [−c,−m] (=theme))

All verbs which lexically select an underspecified cause and a theme argument serve as input to a rule of decausativization which derives the anticausative form of the verb:

(15) Decausativization: Reduction of a [+c] role
V_{Acc} ($\theta_{[+c]}$, θ_j) → V (θ_j) (= (52) Reinhart in press)

This operation eliminates the [+c] argument of a verb with an entry like (14) altogether, giving the thematic structure ([−c, −m]), with a single argument, the theme.[13] The underspecified [+c] argument included in the lexical representation is parallel in many ways to the notion of ''external causation with no specification of the causing subevent,'' which appears in L&RH's analysis.

In summary, L&RH and Reinhart provide a similar characterization of the class of alternating verbs. The ability to characterize the class of alternating verbs on the transitive variant is a basic motivation for assuming a dyadic base. A defining characteristic of the class is that these verbs can appear with a wide range of semantic types of DP, bearing a variety of semantic roles, reflecting the [+c] specification on Reinhart's account and the absence of a lexical specification for the causing event on L&RH's account.

L&RH (though not Reinhart) have a second motivation for the transitive base analysis: they claim that there is an asymmetry between the transitive and anticausative variants of alternating verbs in that the transitive variant is sometimes available when the anticausative is not. L&RH (1995:86) point out that while it is usually assumed that the selectional restrictions on the object of the transitive variant are identical to those of the subject of the anticausative variant, this turns out on closer inspection not to be true (see also McKoon and Macfarland, 2000). They suggest that in all cases of deviance from this situation, the set of possible subjects for the anticausative variant is a subset of the possible objects of the transitive variant. The examples below illustrate for the verbs *lengthen*, *clear*, *empty* and even *break*, that the verb alternates in principle, but not for some choices of theme argument:

(16) a. The mad scientist lengthened the days.
b. The days lengthened.
(17) a. The dressmaker lengthened the skirt.
b. *The skirt lengthened. (LRH:105)
(18) a. The wind cleared the sky.
b. The sky cleared.
(19) a. The waiter cleared the table.
b. *The table cleared. (LRH:104)
(20) a. I emptied the tub.
b. The tub emptied.
(21) a. I emptied the trash can.
b. *The trash can emptied. (RH&L 2012:158)
(22) a. He broke his promise. (cf. 1a&b above)
b. *His promise broke. (LRH 1995:85)

This, they claim, is easier to capture by positing a transitive base and constraining the derivation of the anticausative form of the verb.

[12] The underspecified representation of the cause argument expresses the fact that the alternating verbs select a cause argument in the broad sense, and this subsumes agents, natural forces and instruments. Agents are specified as [+c, +m(ental state)] and instruments and natural forces are specified as [+c, −m], with the difference between them being contextually determined. A verb selecting a [+c] argument, then, is compatible with agents, instruments and natural forces.

[13] In this regard, Reinhart's analysis is different from L&RH's, which claims that the lexical cause argument is still present at some level of representation. It is also different from the analysis in Koontz-Garboden (2009). The analysis presented here is in this regard more similar in spirit to Reinhart's approach, assuming that anticausative verbs do not have a cause in the lexical representation. See the recent exchange between Beavers and Koontz-Garboden (2013a,b) and Horvath and Siloni (2011b, 2013) on this issue.

3. Against a transitive base analysis

In this section I show that both types of motivation for a transitive base analysis are not valid under closer scrutiny and that the facts, when more carefully laid out, mesh better with the position that alternating verbs are lexically associated only with their internal argument(s).

3.1. Alternating verbs are not defined on a dyadic base

I begin with a demonstration that the characterization of the class of alternating verbs provided by L&RH and Reinhart is not accurate, with an illustration from the class of verbs which L&RH have called internally caused change of state (COS) verbs, including verbs such as *blossom*, *bloom*, *flower*, *grow*, and *wilt*. On L&RH's approach, these verbs should not alternate, as they are classified as internally caused verbs, which are, by hypothesis, inherently monadic, and the rule responsible for the alternation lexically binds an argument of a dyadic verb. Indeed, they claim that these verbs do not alternate.[14] Reinhart does not draw a distinction between internally and externally caused COS verbs, and suggests that the verbs in question do in fact alternate. She notes that though the Italian verb *crescere* has only the anticausative variant, the corresponding English verb *grow* has both variants, which she assumes is the expected situation. She suggests that it is a historical accident that *crescere* does not have a transitive variant (see also Chierchia, 2004), and that it has what she calls a frozen transitive entry, assumed to be represented in the mental lexicon though not existing in the actual vocabulary. Closer scrutiny, however, reveals that the English verb *grow* is representative neither of alternating verbs in general (as Reinhart would suggest) nor of internally caused COS verbs. It is different from most alternating verbs since it does not allow the entire range of subjects that one normally sees with alternating verbs. It allows only agentive subjects.

(22) a. John grew tomatoes.
b. *Fertile soil/dedicated care/this machine grew John's tomatoes.

Furthermore, the semantic relation between the transitive and anticausative variant is also not regular, as (22a) does not mean that John causes tomatoes to grow but rather that he cultivates tomatoes (see also Aronoff, 1974). But the verb *grow* is actually different from other verbs which have been called internally caused COS verbs, which systematically *preclude* agent subjects. Therefore, in order to test how internally caused verbs fare with respect to the transitive base theories, it is best not to focus on *grow*, but rather on more representative examples of this class.

As shown by McKoon and Macfarland (2000) and Wright (2002), and discussed further in RH&L (2012:161–162), to the extent that verbs in this class appear with cause subjects, these subjects specify what might be characterized as *ambient conditions* (24) and (25) but not agents or instruments (23).

(23) *The farmer/*the new fertilizer blossomed the fruit trees.
(24) a. Early summer heat blossomed fruit trees across the valley. (LN 1999)
b. The onset of temperatures of 100 degrees or more, on top of the drought, has withered crops. (NYT 1986)

(Wright 2002:341 cited in RH&L 2012:161)

(25) a. Light will damage anything made of organic material. It rots curtains, it rots upholstery, and it bleaches wood furniture. (LN)
b. Salt air rusted the chain-link fences. (LN)
c. Bright sun wilted the roses. (LN)

(Wright 2001:112, cited in RH&L 2012:161)

The behavior of these verbs is then problematic for the account in L&RH (1995), since as internally caused COS verbs they are not expected to show a transitive variant, and it is problematic for Reinhart since, although the verbs alternate, they do not show the full range of semantic roles instantiating the external argument. Furthermore, the feature specifications provided in Reinhart's theory does not allow a characterization of the precise range of subjects which do appear with these verbs; they appear with subjects expressing ambient conditions, but not with other cause subjects such as those denoting events. This class of verbs, then, undermines the claim that the class of alternating verbs can be delimited on the basis of the transitive variant, as claimed by LRH and Reinhart.

[14] They acknowledge (p. 99) that some verbs of this class are occasionally found in transitive variants, and suggest that in these cases the events they describe are construed by speakers as externally caused.

A similar point can be made, though somewhat more subtly, with certain uses of (mainly deadjectival) COS verbs. As discussed in Deo et al. (2013), Gawron (2009), Koontz-Garboden (2010), there are uses of COS verbs which describe the change in the value of an attribute of an entity not over time but over some spatial axis, as in the examples below:

(26) a. Behind the reef the water deepens quickly and currents are strong.
http://www.vinow.com/waterisland/beaches_wi/
b. The skirt narrows at the bottom.
c. . . .and a few meters later the street widened just enough for us to comfortably let him, and about twenty motorbikes, pass by. /
*. . .the construction widened the street. . .
http://travelog.travelvice.com/indonesia/kuta-beach-traffic-problems/

In this kind of use, the verbs describe an inherent property of an entity and are stative rather than eventive. In earlier versions of this paper I assumed that these uses do not have transitive variants at all (see also RH&L 2012:fn. 15). However, as pointed out in Crone (2012), these uses occasionally do have transitive variants expressing the cause of this change over the spatial axis as in:

(27) Santa Barbara has received so much rain this winter and spring that the upper part of the road is interrupted by a rock slide every few hundred meters and in between, an eruption of grasses and scrub oak narrows it to a single track
http://runawaylife.wordpress.com/2011/03/31/romero-canyon-road/ (from Crone, 2012)

Other examples would be those in (28).

(28) a. I like how the band narrows the skirt a bit.
http://artisanssquare.com/sg/index.php?topic=19714.140
b. The current proposed design widens the street for three blocks in the Pioneer Square area
waterfrontseattle.org/. . ./2013_0723_alaskanwaystreetdesign_final
c. But, in the new residential quarters, the houses are raised on pilotis, which widens the street space, and creates a pleasant living climate.[15]
www.ariehsharon.org/TelAviv/Tel-Avivs.../1243297080_4W8rF3w

While COS verbs in this kind of use do allow cause subjects occasionally, they do not allow *agent* subjects. That is, providing such a COS verb with an agent subject necessarily turns to the verb into one which describes the change in the value of an attribute over time and not over a spatial axis, turning it into an eventive, rather than stative, verb.

(29) a. . . .and a few years later, the workers widened the street.
b. The tailor widened the skirt at the bottom.

Verbs in this particular use, then, like internally caused change of state verbs, disallow agent subjects. In section 5.1, I will discuss the reasons for this. Here, I merely point out that the constraint on the cause argument formulated by L&RH and by Reinhart does not capture this generalization. As shown recently in Deo et al. (2013), the different uses of COS verbs can be shown to be derived from a single lexical semantic representation, and so we are not dealing here with a case of separate lexical entries.

This brings me to a more general point about the characterization of the class of alternating verbs as a motivation for the transitive base account. Horvath and Siloni (2011a) following Reinhart, suggest that assuming a transitive base account involving decausativization not only allows for a description of the class of alternating verbs, but also provides an *explanation* for the fact that the class of alternating verbs does not include verbs which lexically select agent subjects (verbs such as *murder* and *assassinate*). They propose what they call a cognitive principle, which they suggest underlies the constraint against eliminating a lexically specified agent[16]:

[15] The meaning of the verb here is somewhat different from the meaning of the verbs in the other examples, since what is compared is not the width of the street at two different points along a spatial axis, but the width of the street before and after the raising of the houses. Nonetheless, the uses are the verb in this use is still stative.

[16] It is unclear whether they intend (30) to express a generalization about lexicalization or about descriptions of events in particular situations, though I interpret them to mean that this is a fact about lexicalization.

(30) Conceptualization of eventualities cannot disregard participants (roles) whose mental state is relevant to the eventuality. (Horvath and Siloni, 2011a:684)

Paradoxically, they use a lexical specification in order to constrain the alternation to verbs which *lack* any constraints on the external argument. But one can derive the same result in an intuitively more satisfying way if the lack of lexical constraints is taken to indicate that the unrestricted argument is not at all lexically specified; English allows an unspecified cause argument to be added to a verb that has no lexically assigned external argument. If there is no rule which adds an argument (semantically constrained or not), it will follow that a verb with a lexically selected agent argument cannot have this argument eliminated, and alternating verbs need no lexical specification for the external argument at all. The addition of the cause argument in the case of internally caused COS verbs is due to the same general option in English. It remains to be seen where the restriction to DPs indicating ambient conditions in the case of internally caused COS verbs and the restriction against agents in the case of spatial extent interpretations of COS verbs come from if the addition of the cause argument is lexically unrestricted. In section 5.1 below, I suggest that it is possible to formulate general constraints on the lexical causative, not tailored to these particular classes of verbs and that once these general constraints are articulated the lexical constraint serves no further purpose.

3.2. Asymmetries in availability of the variants

This section scrutinizes the second argument for a transitive base analysis discussed in section 2: the purported systematic asymmetry in the availability of the variants of the causative alternation for particular verbs, with the transitive variant, but not the anticausative variant being always available. I discuss three subcases of this purported asymmetry. Section 3.2.1 discusses verbs that have no anticausative variant altogether; Section 3.2.2 discusses verbs for which the availability of one variant appears to be dependent on choice of argument. Section 3.2.2.1 discusses the limited availability of the anticausative variant, and section 3.2.2.2 discusses the limited availability of the transitive variant, a state of affairs not expected in the approach or L&RH and Reinhart.

3.2.1. Verbs with no anticausative variant

As mentioned in the introduction, some verbs in English – such as *kill* and *destroy* – are often classified as externally caused and do not specify anything about the nature of the causing event, but nonetheless do not alternate. The fact that these verbs allow a range of DPs as cause can be taken as an indication that they do not specify anything about the nature of the causing event.

(31) a. The vandals/the storm/the intense heat destroyed the crops.
b. *The crops destroyed.
(32) a. The marauders/the poison/the cold killed the chickens.
b. *The chickens killed.

Since the rule giving rise to the causative alternation is a productive one, on the transitive base analysis one would have to find a way to prevent whatever operation is assumed for derivation of the anticausative from applying to a verb like *destroy*. One could resort to something like positive absolute exception marking (Lakoff, 1970), but this kind of mechanism has always been considered undesirable. Reinhart makes use of the notion of a frozen lexical entry mentioned above. However, an analysis which avoids lexical markings or 'frozen lexical entries' is to be preferred, all things being equal. In the current approach, all one needs to assume for these verbs is that they – as opposed to alternating verbs – are lexically associated with two arguments: the argument representing the entity undergoing the change of state and an unspecified cause argument. While usually if a verb selects an argument, it also restricts it semantically in some way, these verbs apparently do not. Since on this approach there is no rule which removes a lexically specified argument, and the causative alternation arises from the *addition* of a cause argument to a verb which lexically selects only one argument, there is no need to resort to frozen lexical entries or marking roots as exceptions to a lexical rule. I discuss these verbs further below in section 4.

I should point out, that some authors (Folli, 2003; Ramchand, 2008), have suggested that there are verbs in English which fit the characterization of alternating verbs but systematically lack a *transitive* variant. If the addition of a cause argument is free in English as I suggest, then one should not find such cases which are not explainable in non-lexical terms. I suggest, however, that once all the factors governing the appearance of the cause argument are made explicit, it will be shown that there are no such cases. For example, Levin (1993:247) lists the verbs of calibratable change of state – such as *skyrocket* and *plummet* – as not having a causative use, but RH&L (2012:163–165) provide a wealth of documented causative variants for the verb *skyrocket* and other verbs of this class. The availability of the transitive variant

in this class is probably more restricted than for prototypical causative alternation verbs, and there are probably a wide range of factors, beyond those that I discuss below, having to do with frequency and collocation which figure into the distribution of these verbs in the various variants, something which I leave for future study.[17]

3.2.2. Availability of variants depending on choice of argument

As shown already in L&RH (1995) the availability of the anticausative variant is partly dependent on the choice of the internal argument. RH&L (2012) and Schäfer (2009) point out that this fact considerably weakens the claim that it is purely lexical restrictions which constrain the appearance of the cause argument. L&RH (1995) hint at nonlexical factors, but leave this issue unresolved. Reinhart insists that the restrictions are lexical. In this section, I scrutinize the arguments and conclude that the cases in which it appears that the availability of the anticausative is dependent on the choice of the internal argument are best accounted for by constraints which determine which variant is appropriate for the description of a particular kind of event in a given context. Agentivity does seem to play a role here, as it does in the restriction against eliminating a lexically selected external argument. However, I show that these two constraints can be distinguished.

3.2.2.1. Unavailability of the anticausative variant. Assuming that the lexical specification of the verb is all that constrains the alternation, all externally caused verbs which are compatible with DPs bearing a range of semantic roles in subject position are expected to appear in both variants irrespective of the properties of the DP chosen as theme. This, however, is not the case. As shown above, verbs such as *clear*, *empty, lengthen* and *shorten* meet the lexical specification of the class of alternating verbs, and they in fact do alternate (33 and 35), but there are certain cases where an anticausative variant is judged ill-formed (34b and 36b).

(33) a. The wind cleared the sky.
b. The sky cleared. (L&RH 1995:104)
(34) a. We cleared the yard of the debris.
b. *The yard cleared (of debris).
(35) a. The mad scientist lengthened the days.
b. The days lengthened. (L&RH 1995:105)
(36) a. The dressmaker lengthened the skirt.
b. *The skirt lengthened. (LR&H 1995:105)

RH&L (2012) point out that it is not just the choice of theme argument that determines the availability of the anticausative variant. (37) involves the same theme argument as in (34), yet the anticausative variant is allowed.

(37) As soon as the yard cleared of snow and became wet, Cosmo didn't want to poop outside anymore.
http://www.dogforums.com/first-time-dog-owner/53773-dog-wont-go-our.html

A similar point is made by the contrast between (38b) and (40a) and between (39b) and (40b).

(38) a. The waiters cleared the counter (of dishes).
b. *The counter cleared (as the anticausative of (a)).
(39) a. We cleared the stadium of the chairs.
b. *The stadium cleared.
(40) a. The counter cleared of people. I quickly approached and was overwhelmed with the beautifully crafted chocolates neatly lined in the pristine case. The woman behind the counter ended up being Jeanne, one of the two owners of Sweet Divas.
http://www.yelp.com/biz/sweet-divas-chocolates-st-petersburg
b. The stadium cleared quickly at the end of the game. (Good if cleared of people, not if cleared of chairs.)

L&RH (1995:102) suggest that the rule of lexical binding is restricted to cases of verbs that denote an ''eventuality [that] can come about spontaneously without the intervention of an agent'' (cf. Haspelmath, 1993; Smith, 1970). This accounts for the contrast between (33b) and (35b) which describe events that can take place without an agent on the one hand, and

[17] The verbs in this particular class of verbs do not specify the property which undergoes a scalar change but rather something about the nature of the scalar change, with the argument specifying the specific property. This may end up being relevant to the relative availability of the expression of the cause.

(34b) and (36b) which cannot, on the other. The explanation for the examples in (40) begins with the recognition of the fact that the verb *clear* has two internal arguments: one denoting an area which becomes clear, and the other denoting what the area becomes clear of. In these particular examples, the area becomes clear of people, and the people are capable of acting as agents. Therefore, the agents, as internal arguments of the verb, are participants in the change of state event. In such a case, the change of state can come about without the intervention of an *external* agent. In cases such as (34b), (36b) and (38b) it is not the meaning of the verb which determines the crucial involvement of an agent, but rather knowledge of the world which tells us that certain events of lengthening, emptying and clearing can only come about with the intervention of an agent, while others do not need the intervention of an agent. The constraint then does not seem to be lexical in nature (Schäfer, 2009). Rather it appears to be a constraint on the appropriateness of the anticausative variant in the description of events of a certain type. L&RH (1995:107) suggest that this constraint can be recast as the following: ''[a]n externally caused verb can leave its cause argument unexpressed only if the nature of the causing event is left completely unspecified.'' This constraint prevents the operation of lexical binding from applying to verbs like *murder* and *assassinate*, which, as mentioned, specify something about the nature of the causing event. The reason for assuming that this formulation of the restriction can replace the one based on spontaneity and intervention of an agent, is that, as they suggest, all lexical restrictions on the nature of a cause are restrictions involving agentivity.

What appears to be implied by L&RH is that there is a general constraint of which the lexical constraint is a specific subcase. The general constraint would be that in the description a change of state which involves an agent external to the change of state, the agent must be expressed (cf. Horvath and Siloni's cognitive constraint in (30)). For a verb which does not lexically restrict the cause argument, this constraint precludes the use of an anticausative verb only if the verb is used to describe an event involving an agent. If a verb can *only* describe an event involving an agent because of its lexicalized meaning, then the anticausative cannot be derived, or it can be derived but not used.

However, contra what is implied by L&RH (1995), the constraint against the nonexpression of a lexically selected agent must be kept separate from the constraint on the use of the anticausative variant of alternating verbs for the description of events involving agents. This is because there are situations in which an alternating verb can indeed be used in the anticausative variant to describe an event involving an agent (as in (41)), but this possibility is not available for a verb which lexically selects an agent (as in (42)) (cf. RH&L 2012).

(41) a. I pounded on the piggy bank and it finally broke.
b. I leaned against the door and it opened.

(42) *This time I aimed carefully, fired accurately, and the victim finally murdered.

What we see above is that for alternating verbs, if the cause is specified in the preceding context, it does not have to be expressed as the subject of the verb. In contrast, a verb which lexically selects an agent must appear with the agent as the subject of the verb. This, however, raises a new question: why do the anticausative variants of verbs such as *open* and *break* appear to be appropriate for the description of agentive events (as in 41), while this seems not to be the case for verbs such as *empty*, *lengthen* and *shorten*, as illustrated for example in (34b) and (36b)? I return to this issue in section 5.2.

Reinhart (in press) explicitly insists that the constraint on decausativization is lexical and argues against the position in L&RH (1995) ''. . .that appear[s] to support an approach based on world knowledge and properties of eventualities'' (p. 29). In particular, Reinhart makes reference to the following examples:

(43) a. The days lengthened.
b. (*)The skirt lengthened.
c. *His promise broke.
d. Skirts lengthened since the sixties.
e. Skirts cannot lengthen spontaneously.

She claims that (43b) above is in fact well-formed, citing examples such as (43d,e) to support this claim. She notes: ''It is just hard to imagine a situation in which (ii=43b) can be true.'' She suggests that the reason (43c) is ill-formed is that *break a promise* does require an agent (*The circumstances/his dishonesty broke his promise).

I agree with the grammaticality judgments here, and the contrast between (43b) and (43d,e) is indeed very striking. Moreover, I agree, as hinted above, that the correct analysis is one in which for these verbs both variants are in principle available. However, unlike Reinhart, I take these examples to indicate that a central component of the analysis is the specification of the conditions under which the cause argument must appear. Presumably Reinhart intends that *The skirt lengthened* cannot be ''true'' because the use of the anticausative indicates the absence of an agent and skirts cannot

undergo a process of lengthening without an agent. However, the examples in (41) show that the use of an anticausative does not necessarily indicate the absence of an agent. What are the conditions which allow the use of the anticausative for the description of an event involving an agent in the case of (41) and (43d) but preclude it in cases such as (43b)? As just mentioned, I discuss this in section 5.2.

3.2.2.2. Unavailability of transitive variant. One of the main motivations for L&RH's (1995) assumption that the causative variant is basic is their claim that verbs denoting externally caused events always have a causative variant and it is only in a subset of cases that the anticausative variant is available. This generalization, however, does not hold. There are uses of alternating verbs which have no natural causative variants.

(44) a. The days lengthened into weeks.
b. ?The wait lengthened the days into weeks.
(45) a. My watch broke after the warranty ran out. (Most likely indicates cessation of functioning due to normal wear and tear)
b. I broke my watch after the warranty ran out. (wrong interpretation; this doesn't suggest that the watch broke from normal wear and tear)
(46) a. Although Nadia has a wide forehead and a slightly pointed chin, because her face narrows around her cheekbones her face shape would be most likely classified as heart shaped with a touch of squareness. http://www.hairboutique.com/tips/tip6201.htm
b. Unclear what an appropriate cause subject would be here
(47) a. The Hogup Mountains have a central section containing the three major peaks; the mountain range narrows both northerly and southerly into the Great Salt Lake Desert http://en.wikipedia.org/wiki/Hogup_Mountains
b. Unclear what an appropriate cause subject would be here

If all causative alternation verbs derive from a concept with an external cause, then one would be forced to say that these examples involve a separate though perhaps related, concept, without an external cause. (45) may turn out to be an idiosyncratic use of the verb *break*, but there is no reason to assume that the uses of the verbs in the other examples involve a distinct lexical concept, as their meaning can be compositionally derived from the root and the morphological structure (Deo et al., 2013). Rather, these examples further indicate the need to formulate the precise conditions which control the appearance of the cause argument and in this case preclude it. I return to examples such as these in section 5 and discuss why the causative variant here is lacking.

Summarizing this section, two of the main motivations for positing a dyadic base for alternating verbs – the ability to characterize the class of alternating verbs on the dyadic base and a purported asymmetry in the availability of variants – do not hold up under further scrutiny. This paves the way toward an analysis in which alternating verbs are not lexically associated with an external argument.

4. The lexically encoded properties of change of state verbs

Since we have been building toward an analysis in which contextual factors play a significant role in the distribution of the variants of the causative alteration, we may ask what *lexical* distinctions are nonetheless needed. L&RH (1995) suggested that a lexical distinction between internal causation verbs and external causation verbs is relevant, but we saw in section 3.1 that verbs in both classes alternate, though in different ways. In this section I review the analysis in AAS (2006), which provides a finer-grained lexical semantic classification of verbs than L&RH's. I will take issue with their lexical semantic classification of roots/verbs. Nonetheless, it shares with the analysis supported here the assumption that alternating verbs are lexically associated with the internal argument(s) only[18] and that the cause argument is introduced non-lexically.

AAS provide a four-way classification of roots[19]; their claim is that the alternation properties of the verbs are determined by the encyclopedic information about the root (i.e., the kinds of events in the world that the roots refer to) along with the semantics of the syntactic environment that the roots are inserted into (i.e., the structure determined by the functional heads made available). The classification of roots they suggest is:

[18] As made clear immediately below, on their analysis the *roots* of alternating verbs are lexically associated with the internal arguments only. Since verbs are built in the syntax, one variant or another of an alternating verb may be associated with the cause argument.

[19] I do not review all aspects of the proposal in AAS, which is also meant to account for the distribution of voice morphology in a variety of languages. I restrict my attention to the classification of the roots.

(48) a. **agentive:** (like *murder*) never alternate across languages – they are always transitive;
b. **internal causation:** (like *blossom* and *grow*) never alternate across languages – they are always intransitive;
c. **external causation:** (like *kill* and *destroy*) – do not alternate in languages like English which do not mark the alternation morphologically, but do alternate in languages like Greek and Hebrew, in which the alternation is morphologically marked. In these latter languages the intransitive variant is morphologically marked.
d. **cause-unspecified:** (like *break* and *open*) – alternate across languages: the suggestion made by AAS (see also Schäfer, 2008) is that when they are transitive they express external causation (as in (c) above) and when they are intransitive they express internal causation (as in (b) above).

I take issue primarily with the idea that alternating verbs are conceived of as internally caused in the anticausative variant and externally caused in the transitive variant. But first, I briefly mention two other problems with the analysis. First, as illustrated in section 3.1, verbs classified as internally caused do indeed alternate in English,[20] and I return to these verbs in section 5.1. I suggest that all alternating verbs are unspecified for the type of causation, and there is no grammatically relevant distinction between verbs denoting internally caused changes of state and externally caused changes of state. Second, I describe the difference between nonalternating verbs such as *kill* and *destroy* and alternating verbs like *break* somewhat differently than AAS. I turn now to a discussion of the former class.

Recall that verbs like *destroy* and *kill* do not restrict the kind of cause argument, but still do not alternate.

(49) a. The vandals/the storm/the intense heat destroyed the crops.
b. *The crops destroyed.
(50) a. The marauders/the poison/ the cold killed the chickens.
b. *The chickens killed.

In section 4 above, I suggested that these verbs – as opposed to alternating verbs – are marked as lexically associated with both a theme argument and a cause argument. I propose that there is no further need for a semantic classification of roots to derive the alternation possibilities of verbs. The very same change of state can be described using a verb which lexically selects a cause argument – like *kill* or *destroy* – or by a verb which does not – like *die* or *break*. For example, in the following sentences, both *destroy* and *break* are used in the sense of 'cease functioning' as applied to a computer, where the cause is identified as a virus. The verb *break* allows this change of state to be expressed in the anticausative, but the verb *destroy* does not. This is accounted for by attributing to *destroy* – but not to *break* – the lexical selection of the cause argument.

(51) a. She has it in her head that your computer broke from a virus from the sites you visited. . .
http://answers.yahoo.com/question/index?qid=20110630130634AAnqmHh
b. A virus destroyed my computer./*My computer destroyed from a virus.
http://answers.en.softonic.com/p/a-virus-destroyed-my-computer-did-picasa-store-my-photo-files

The same point can be made for the verbs *kill* and *die*. The same event can be described by (52a) and (52b).

(52) a. He died from exhaustion/the bullet wound.
b. Exhaustion/the bullet wound killed him.

Since (52a&b) describe the very same change of state brought about by the very same cause, it does not seem reasonable to assume that (52a) describes an event of external causation and (52b) an event of internal causation. Rather, it seems that *kill* is the suppletive causative form of *die*, as corresponding verbs are in many languages (Haspelmath, 1993). As such *die* can describe an event as being attributed to an external cause or not, but *kill*, as lexically associated with a cause argument, can only describe an event as being attributed to an external cause.[21] It is not the nature of the change of state – that of dying – which determines the adicity of the verb; rather *die* encodes the very same

[20] I know of no systematic study of how these verbs behave cross-linguistically.
[21] As discussed in section 5.1 below, the relevant distinction seems to be whether the change of state comes about in the natural course of events or not. *Die* can describe (but does not have to) death as coming about in the natural course of events, whereas *kill* cannot.

change of state as *kill*, except that for this verb, as opposed to other verbs which encode changes of state, there is a different form for the transitive variant. This is consistent with the analysis I provide here that alternating verbs are lexically monadic, and a verb like *kill* or *destroy* is lexically marked as transitive.[22]

I now move to a discussion of the roots which AAS call 'cause unspecified.' They suggest that since externally caused verbs are necessarily transitive in the active form, and internally caused verbs are necessarily intransitive, cause-unspecified verbs are based on roots which can be construed as either internally or externally caused and will alternate accordingly.

There are indeed verbs which appear easily with a cause with some choices of theme and much less easily or perhaps almost never with other choices of theme argument. One way of describing such a situation would be that these verbs can describe either internal or external causation. This seems like a natural description of verbs derived from dimensional adjectives. There is nothing in the nature of the state described by these adjectives which would determine that an event of a change in the value of a property described by one of these adjectives is necessarily either internally or externally caused. Without some external cause, a street will not broaden, and so one might say that (53a) expresses external causation. And although there are surely causes which bring about the broadening of one's face as one grows older, this happens in the natural course of events as time goes by. Correspondingly, (53b) does not really have a natural causative variant, along with most cases of verbs normally considered to denote internally caused events.

(53) a. When the Nazis took over, they broadened the street to turn it into their ideal parading ground. http://motherlandmyass.wordpress.com/2007/07/30/history-lessons/
b. As she got older, her face broadened.
c. ?Growing/?Aging broadened her face.

Although for *broaden* it seems natural to say that the verb describes external causation in (53a) and internal causation in (53b), this is not an appropriate description in all cases of alternating verbs.

First, if one variant were associated with external causation and the other with internal causation, one would expect the change to be predicated of different themes in the two cases. However, as opposed to the examples just cited in which DPs which can be the theme argument of the causative variant are typically different from the DPs which can be the theme argument of the anticausative variant, the range of DPs in both positions for most alternating verbs is very close to being identical.[23]

(54) a. The vase/the window/the bowl/ the radio/the toaster/ his leg/the branck broke.
b. John broke the window/the bowl/the radio/the toaster/ the branch/his leg. . .

Second, the anticausative variant of *break* often has the cause specified outside of the sentence in the immediate discourse environment, as illustrated above in (41); other examples are given below in (55):

(55) a. Getting ready to dine I grabbed the chair, pulled it out, sat down and then the chair broke into kindling while I fell on my hind end.
http://whatfatpeopledontlike.wordpress.com/tag/pie
(=RH&L 2012:40)
b. As he made his way from the car to the sidewalk to help me into the passenger seat, poor Eli lost his footing [. . .] Down he went, with the Muhammara in hand. So heroic is Eli that the blue bowl actually never left his hands. Still, the impact was too much, and the bowl broke into several neat pieces. http://www.sweetamandine.com/2009/01/swan-song.html

[22] This is of course also consistent with AAS's view that *kill* is externally caused; however I maintain that this does not follow from the nature of the change of state that verb encodes. A reviewer points out that verbs corresponding to *kill* do not alternate in many languages (as mentioned in the text, corresponding verbs in many languages are suppletive). This is not surprising as one can easily understand that there is human interest in lexically distinguishing death which is attributed to an external cause and death which is not, and factors of this sort may govern which kinds of concepts get lexicalized in a language. Note, however, that there are languages which *do* have nonsuppletive verbs corresponding to *kill/die* which do alternate: Hebrew, for example has one verb *lehamit* (to kill) which is clearly the causative form of *lamut* (to die) and an unrelated verb meaning "kill" (*laharog*). On the position I am arguing against, one would have to say that *laharog* is a verb of external causation, whereas *lehamit* is the causative of a verb of internal causation. Such a position doesn't seem reasonable to me. The reviewer also points out that verbs such as *clean* and *cut* appear not to alternate in many languages and they should be classified as externally caused. I refer the reader to Rappaport Hovav and Levin (2010), Levin and Rappaport Hovav (in press) for a discussion of such verbs. They both have, in addition to the normal COS reading, a manner reading with different properties. In English, the COS variants of *clean* and *cut* have anticausative forms in very restricted contexts.

[23] It may turn out that the sets of DP is never fully identical, but it is sufficient for me to show that there is very significant overlap between the two sets of DPs, in many cases, as opposed to the situation in (54).

It is difficult to argue that a change of state is construed as internally caused when the immediately preceding sentence indicates the cause of the change of state. In fact, these very same events can be described with the causing event/agent in subject position of the same alternating verb, and the nature of the causation does not appear to shift in this case:

(56) a. Plopping down so hard broke the chair./I broke the chair (when plopping down so hard).
b. The impact broke the bowl/Eli broke the bowl (when he fell).

To summarize, in the realm of change of state verbs,[24] I make a three-way distinction. (i) Verbs like *murder*, which specify something about the nature of the involvement of an external cause, are lexically associated with an argument representing the external cause, and this argument cannot be omitted. (ii) Verbs, like *kill* and *destroy*, which specify nothing about the nature of the causing event, but are nonetheless lexically associated with an argument representing the cause. Here, too, the argument cannot be omitted. The verbs of the first two classes are not distinguishable in terms of lexical adicity in English. (iii) Finally, all alternating verbs are lexically associated with the internal argument(s) only, namely, those involved in the specification of the nature of the change of state. I do not assume a grammatically significant lexical distinction between verbs denoting internally caused changes of state versus verbs denoting externally caused changes of state. We can only talk about whether a sentence includes a specification of a cause distinct from the internal argument(s) or not. It is in this sense that I take the notion of external causation to be a property of event descriptions, and not construals of events determined necessarily by the verb (see fn. 10). What needs to be developed now is an account of what governs the nature and presence of the external cause argument for alternating verbs. This is the topic of the next section.

5. Factors governing the appearance of the cause argument for alternating verbs

As mentioned, I assume, along with RH&L (2012) and AAS (2006), that alternating verbs are lexically associated with the internal argument(s) only. I assume that English freely allows an external cause to be added to change of state verbs. It remains then to be shown what nonlexical factors control the appearance of the cause subject and what factors determine the range of semantic types that can function as the cause argument. I follow RH&L (2012) in assuming that the well-known restriction that lexical causatives express direct causation (Bittner, 1999; Fodor, 1970; McCawley, 1978; Shibatani, 1978; Wolff, 2003), will account for the restricted range of semantic types in certain cases. In section 5.1, I summarize their argument and illustrate how it applies to what have been called internally caused COS verbs and stative uses of COS verbs. See RH&L (2012) for illustration with respect to other verbs. In section 5.2 I turn to the question of the principles governing the (non)expression of the cause argument.

5.1. Direct causation as a necessary condition for the appearance of an external cause

RH&L (2012) discuss a number of subject–object interdependencies in the transitive variants of causative alternation verbs (see also McKoon and Macfarland, 2000 for similar observations), where the semantic type of subject argument depends on the kind of theme occurring with it. They propose that a central constraint on the addition of the cause argument is that the cause argument be construable as a direct cause (57 below) and that this will account for a range of subject–object interdependencies in causative alternation verbs.

(57) *The Direct Causation Condition*: A single argument verb may be expressed in a clause with a transitive verb if the subject represents a direct cause of the event expressed by the verb and its argument. (RH&L 2012:160)

The notion of direct cause they make use of is taken from Wolff (2003):

(58) ‘‘Direct causation is present between the causer and the final causee in a causal chain: (i) if there are no intermediate entities at the same level of granularity as either the initial causer or final causee, or (ii) if any intermediate entities that are present can be construed as an enabling condition rather than an intervening causer.’’ (Wolff 2003:5; RHL:160)

[24] L&RH use the notion of internal vs. external causation for what appear to be causative alternation verbs that are not change of state verbs (i.e. the contrast between *lean* and *loom*, or *shake* and *shiver*.) RH&L (2012) use the notion of direct and indirect causation to account for other pairs of this sort, including verbs of sound emission. In this paper, I restrict my attention to change of state verbs and leave it to future work to determine how general the analysis here is.

In principle, alternating verbs do not directly impose semantic restrictions on the cause argument but different verbs allow different ranges of cause arguments to appear because different entities have the ability of being construed as direct causes for different kinds of changes of state.

For example, RH&L (2012) suggest that (57) and (58) together restrict the range of subjects for internally caused COS verbs, as illustrated in section 3.1 above. The reasoning is as follows. The most direct causes of such changes are natural forces and ambient conditions which trigger or facilitate these changes. In order to introduce an agent in an event of this sort, the agent would have to precede the natural force or ambient condition in the chain of causation. For the agent to then qualify as a direct cause in the causal chain, the natural force or ambient condition must be considered an enabling condition (part (ii) of (58)), but this is not possible as the agent does not have control over them.

As RH&L point out, when an agent does in certain circumstances have control over ambient conditions, an agent can be construed as the cause for internally caused changes of states, as in *We germinated the seeds* or *We fermented the wine*.[25]

In section 3.1 above, I discussed certain uses of COS verbs which preclude agent subjects. This, too, follows from general properties of causative events. Agents always participate in eventive – as opposed to stative – situations. Since the uses of COS verbs in (27) and (28) above are all stative, it follows that the external argument cannot be an agent.

5.2. Factors governing the (non)appearance of the direct cause argument

Given the principled availability of a causative and an anticausative variant of an alternating verb, we may ask which variant is most appropriate for the description of an event in a given discourse context. This question has not been explored much in the literature in the context of the causative alternation, though it has in the context of the dative alternation (Arnold et al., 2000; Bresnan et al., 2007; Erteschik-Shir, 1979; Thompson, 1990, among many others) and the passive (Krauthamer, 1981; Thompson, 1987, among others). This difference in approach to the two alternations is perhaps attributable to the fact that the variants of the dative alternation are often truth-conditionally equivalent (Rappaport Hovav and Levin, 2008), as are corresponding sentences with the active and passive forms of a verb, whereas the two variants of the causative alternation are not. When the two variants are truth-conditionally equivalent it is natural to attribute the choice between the variants in these cases to non-semantic factors. However, while the variants of the causative alternation are not truth-conditionally equivalent, there is a relation of entailment between them: the causative variant entails the corresponding anticausative variant. Put differently, any situation a causative variant can describe can be described truthfully by its anticausative counterpart. Since the two variants can in principle be used to describe the very same state of affairs, the question then does arise as to what variant is to be preferred in a given context.

The choice between alternative linguistic expressions with an entailment relation between them is typically thought to be governed by principles such as Grice's maxims of conversation. And, indeed, McCawley (1978) suggests that principles of conversation are at work in the determination of the appropriateness of a given variant in a particular context, with the perspective of the speaker being relevant[26] as well. The examples he discusses are:

(59) a. The door of Henry's lunchroom opened and two men came in.
b. The door of Henry's lunchroom opened and two men went in.

(McCawley, 1978)

As McCawley points out, chances are that in (59b) the men did not open the door themselves. The choice of the verbs *come* and *go* here determines the orientation of the speaker: in (59a) the speaker is most likely in the lunchroom while in (59b) the speaker is most likely outside of the lunchroom. As a consequence, (b) invites the inference that the speaker sees the men, which in turn invites the inference that the men did not open the door themselves. What is the source of this last inference? Apparently, if the speaker sees the men open the door, the speaker is required to mention the men as the openers of the door as in:

(60) Two men opened the door of Henry's lunchroom and went in.

[25] RH&L use this constraint to account for a range of other data concerning the causative variants that are available or not and for a variety of interdependencies between choice of subject and choice of object in certain causative alternation pairs. It seems to me that careful scrutiny of the data will show that many types of verbs display these kinds of subject-object dependencies, which can be ultimately accounted for by the direct causation constraint. I leave it for future research to work out the details.

[26] DeLancey (1984:202–204) discusses the discourse conditions in which it is appropriate to describe a situation with an instrument subject as opposed to an agent subject. I suspect that an account similar to the one I develop here will be applicable in those cases as well, since one way of interpreting the data he presents there is that the perspective of the speaker is relevant there as well.

The generalization which McCawley (p. 247) offers is:

(61) Intransitive *open* cannot be used if the speaker has witnessed an ACT of opening, unless he has otherwise indicated that the event is part of an act.

The relevance of the speaker actually witnessing the act of opening is supported by the fact that if the speaker sees the men but does not see them opening the door, either because his attention was diverted or because his view was occluded, the anticausative is indeed appropriate, but it also invites the inference by the hearer that the speaker does not know how the door opened. McCawley also points out that if the lunchroom had all glass walls so that a viewer from the inside can see what is going on outside and vice versa, (59a) would also be inappropriate if the men opened the door themselves.

The *unless* clause in (61) is necessary for cases like the following:

(62) I pushed and pushed on the door, and finally it opened. (= (2))
McCawley (1978)

Here, the act is that of pushing and the change of state is conceived of as part of the act. McCawley concludes from this, as I do, that a verb such as *open* does not lexically specify the presence of an agent, and the mention of an agent, if there is one, is dictated by principles of conversation.

Though McCawley's observations are important, it is unclear exactly what is meant in (61) by an ''event'' (where *change of state* is intended) being part of an ACT (where *action of an agent* is intended). It may mean temporal overlap, in which case the generalization is that if the action of the agent and the change of state are at least partially co-temporaneous, the agent must be expressed. This is reminiscent of RH&L's (2012) Proper Containment Condition ((63), inspired by McCawley's generalization) which was meant to account for examples such as (64).

(63) **Proper containment condition**: When a change of state is properly contained within a causing act, the argument representing that act must be expressed in the same sentence. (= RHL (41))

(64) a. The seamstress lengthened my skirt.
b. *My skirt lengthened.

In this example, the temporal extent of the event of the change of state (the skirt becoming longer) is contained within the temporal extent of the activity of the agent. RH&L (2012:173) suggest that, in contrast to examples (59a) and (59b) covered by McCawley's principle in (61), examples such as those in (64b) are excluded independent of the perspective of the speaker. I will show that this is not the case, and that examples like (64b) are more similar to cases like (59) than RH&L thought.

I begin with the assumption in (65):

(65) In the description of a change of state, the cause of the change of state is relevant; therefore, since an utterance which specifies the cause of the change of state is more informative than one which expresses just the change of state, it is to be preferred, all things being equal.

All things being equal, then, the transitive variant, which specifies the cause, will be preferred over the anticausative variant, which does not. The choice of the more informative variant is preferable if the extra information is relevant. I assume that the relevance of the cause is related to the deep-seated intuition that people have that changes of state do not occur without cause. The validity of this assumption is supported by the fact that in the context of a question which explicitly makes the cause irrelevant, the anticausative can be appropriate where it would normally not be. So, if I see Jack opening the door and someone asks: ''Did the door open?'' I can give a positive answer, and I don't have to say ''Jack opened the door.'' This is in opposition to the case in which I ask ''What happened?'' in which case ''The door opened'' would be inappropriate.

When are all things not equal? That is, when is the anticausative licensed even though a corresponding causative is more informative? I suggest that there are two such conditions: (i) the cause is recoverable from context; (ii) the speaker does not know the cause. I discuss these in turn below.

5.2.1. The cause is recoverable

There are two cases of recoverable causes. The cause may be recoverable as a default, or it may have been established earlier in the discourse.

5.2.1.1. Default cause. Many events of change have default causes: we might characterize these as changes which occur in the normal course of events. Whether a verb describes such a change of state is not always lexically determined

by the verb, but often by the verb and its argument(s) and sometimes only in particular contexts. Consider, for example, a verb such as *lengthen*. Hair lengthens in the normal course of events, and so do days, but skirts do not. The cause of the lengthening of the days or hair is normally not mentioned because though not all speakers have scientific knowledge of what causes days or hair to lengthen, it is known that there is a given set of causes which does not normally change. So, when we say that the days lengthen or someone's hair lengthens, without mention of the cause, we imply that whatever scientists will determine as the default cause, is the cause in this case.[27] This is the sense in which the cause is recoverable. Conversely, if we *hear* a sentences such as *Her hair lengthened* or *The days lengthened*, in isolation, we will infer that the cause of lengthening was the recoverable, default cause, i.e., that her hair or the days lengthened in the normal course of events. In fact, in these cases, when the cause is recoverable by default, the use of the causative would be odd, and this can be attributed to some version of the Maxim of Manner which dictates avoiding prolixity. There are, however, cases in which what is described as the lengthening of days is attributed to a cause other than the default one.

(66) a. But Board of Education members said they **lengthened the days** to ensure students receive the equivalent of 180 days of instruction.
http://news.google.com/newspapers?nid=1957&dat=19960406&id=g4hGAAAAIBAJ&sjid=r-kMAAAAIBAJ&pg=1078,1019911

b. Using bright, fluorescent lights, researchers artificially **lengthened the days** for 12 people who agreed to spend 65 days living in individual rooms without windows, clocks or any other clues as to the time in the outside world.
http://www.marsdaily.com/reports/Not_Enough_Hours_In_The_Day_Then_Look_To_Mars_999.html

In these cases, it is not the length of the day has been changed, but rather the amount of time which is considered ''day.'' This kind of change is not something which happens in the normal course of events, and there are many causes which can be associated with this kind of change. Since there is no default cause for such a change, it would not really be possible to report such a lengthening of days with the anticausative (though it might if the cause was mentioned in the previous discourse).

Many of the verbs which L&RH classify as internally caused are verbs which often denote changes which come about in the normal course of events. However, as just mentioned, whether or not a verb describes such a change often depends on the theme argument. McKoon and Macfarland (2000) follow L&RH (1995) in classifying verbs (absolutely) as internally or externally caused, and they notice (p. 842) that for the transitive variants of internally caused COS verbs, there is a high proportion of objects denoting abstract entities. Their suggestion is similar in spirit to mine: ''Perhaps, we speculate, for the speakers or writers of the sentences in the corpus, the concrete entities they spoke or wrote about were likely to change state through some inferable cause or means, whereas for abstract entities, the cause or means of a change of state more likely needed to be made explicit. While listeners or readers might be expected to know how beach erosion comes about, they might not be expected to know how erosion in public morals comes about.'' Put differently, the cause of erosion of beaches is recoverable by default, whereas the cause of the erosion of morals is not. McKoon and Macfarland continue to classify verbs like *erode* as internally caused, but there does not seem to be any sense in calling an event such as the one reported in (67) ''internally caused.''

(67) The system has eroded the morals of young people.

Therefore, there is no need to lexically mark *erode* as a verb of internal causation. Rather, there are certain changes of state which this verb can describe which come about in the normal course of events. In these cases, these verbs will normally not appear with a cause argument, as there is a cause recoverable by default. When the verbs describe an event not meeting this criterion, they often will appear with the cause specified. This approach is supported by on observation made in Wright (2002). She points out that in many cases where a verb normally classed as internally caused appears with a subject indicating ambient conditions the subject is modified as in the examples in (24) and (25) above. She also points out that informants rate such sentences as more felicitous when they appear with modified subjects. This is not the case with verbs that she describes as externally caused. She, too, points to the redundant nature of the specification of the subject for internally caused COS verbs. One might think of what is going on in these cases as follows. One property which seems to characterize changes which happen in the normal course of events is that there are a number of causes normally present simultaneously. A speaker typically does not know whether to attribute the cause of a tree growing to the moisture in the earth, the nutrients in the earth, the exposure to the sun or to the spacing between trees. This gives rise to a difficulty in singling out the primary cause for the change of state. The literature on lexical causatives has determined that the subject of the causative

[27] I have not done systematic corpus searches to back this up, but the way we interpret the anticausative in isolation, namely that the hair lengthened in the normal course of events, certainly supports this approach.

is conceptualized as proximate and ultimate. For changes which happen in the normal course of events, it is typically difficult to isolate one participant in the chain of causality as such. In examples in (24) and (25) above, the modifiers signal that one of the default factors is unusual, and so it can be singled out as more important than the others and ultimately responsible for the change. I assume that the explanation for the data in (10) above repeated here, involves the same logic.

(68) a. My watch broke after the warranty ran out.
b. *I broke my watch after the warranty ran out (does not have the same interpretation as (a)).

When a watch breaks (in the sense of ceasing to function) from normal wear and tear, the normal wear and tear is the default cause, but it is difficult to single out one primary factor.

However, it is not just the identity of the theme argument which determines whether the cause is recoverable. Other contextual factors can be relevant, as seen with a verb like *clear*. A sentence such as (69), uttered without any supporting context, can only be understood as a case of the yard clearing of snow in a setting of gradual warming as winter gives way to spring. When uttered in the dead of winter, when there is no default, recoverable cause, the cause must be mentioned. That is, (70b) cannot be understood as describing the same event as (70a).

(69) The yard cleared of snow.
(70) a. The snowblower cleared the walk of snow.
b. (#)The walk cleared of snow.

The same would be true in the case of an area clearing of people, as in (40a) and (40b) above, repeated below. If the context makes clear that an area contains people, the area can be said to clear since the cause of the clearing of the area is the people themselves.

(71) a. The counter cleared of people. I quickly approached and was overwhelmed with the beautifully crafted chocolates neatly lined in the pristine case. The woman behind the counter ended up being Jeanne, one of the two owners of Sweet Divas.
http://www.yelp.com/biz/sweet-divas-chocolates-st-petersburg
b. The stadium cleared quickly at the end of the game. (Good if cleared of people, not if cleared of chairs.)

5.2.1.2. Previously mentioned cause. A different case of recoverability is when the identity of a cause has been established in the preceding context. These are cases such as those illustrated in (41) above and repeated below, where the cause of the change mentioned in the preceding context licenses the anticausative variant of the verb.

(72) a. I pounded on the piggy bank and it finally broke.
b. I leaned against the door and it opened.

As mentioned above, the anticausative is licensed, even when context makes clear that the causing action was carried out agentively. If the agent of an action was established in the preceding context, the agent may be omitted from the clause describing the change of state.

What about cases such as (17b), (19b) and (21b), repeated here, which are judged ill-formed in isolation, and the ill-formedness has been attributed to the fact that the causing action must be carried out agentively? What makes these different from (72)?

(73) a. *The skirt lengthened.
b. *The table cleared.
c. *The trash can emptied.

Since these verbs alternate, the analysis here would predict that if the agent is recoverable the anticausative should be license. Indeed, this is the case.

The following examples, the last two found on the web,[28] involve events which require the participation of an agent, but with the agent established earlier in the context.

[28] In conducting searches for these examples I noticed that the anticausative form in very many cases is in a clause beginning with ‘‘as. . ..'' This suggests that it is the progress of the change of state which is in focus here, which apparently further removes the act bringing about the change of state from the focus of the description.

(74) My mother decided to knit me a scarf with my sorority insignia on it. At first I couldn't recognize the insignia, but as the scarf lengthened, more and more of the insignia became recognizable.

(75) Last year, I started crocheting a scarf for my cousin. I went to the yarn store and got some lovely variegated yarn to work with. When dad was in the hospital last year, it was so good to have something soothing to do. As the scarf lengthened my stress lightened up, too.
http://hopegreenefield.wordpress.com/category/parkinsons/page/3/

(76) Using his bare hands and sharpened sticks, Lame Hawk began to tunnel under Nimbock's limp body. He worked tirelessly, ignoring his blistered and bleeding hands and watching with satisfaction as the ditch deepened.
http://www.lds.org/ldsorg/v/index.jsp?hideNav=1&locale=59&sourceId=d2623c4445e9b010VgnVCM1000004d82620a____&vgnextoid=21bc9fbee98db010VgnVCM1000004d82620aRCRD

Without such contextual support, these anticausatives are judged ill-formed, especially when presented as paired with the causative:

(77) a. The workers deepened the ditch.
b. ?The ditch deepened.
(78) a. My mom lengthened my scarf.
b. ?My scarf lengthened.

The cause may not have been explicitly mentioned, but may be hinted at in the surrounding context. For example, while one would normally judge (79b) as ill-formed, in the context of (80) a corresponding anticausative is judged appropriate, since in the context of Halloween, we know that the children coming for ''trick or treat'' are responsible for the removal of the candy, though the speaker is not attributing the change to any specific person.

(79) a. The kids emptied the candy jar.
b. ?The candy jar emptied.

(80) On Halloween night, I give my neighbor a jar full of candies to distribute to the kids coming to the door. I drop by a few hours later and notice that the jar has emptied.

Another example would be (81) uttered in the context of an event with many tables and food served by waiters.

(81) As the night wore on, the tables slowly cleared and there was nothing left for the latecomers to eat.

In the next section, I address the question of why examples with these verbs need more contextual support than examples with verbs like *break* or *open* to license the anticausative in an agentive use.[29]

5.2.2. The speaker does not know the cause

Another situation which can license the use of the anticausative even though the causative variant is more informative, is one in which the speaker does not know the cause of the change of state, as in (59a) above, repeated here, where the verb *come* puts the speaker in a perspective in which he cannot see who opened the door.

(82) The door of Henry's lunchroom opened and two men came in.

In contrast, if I see John slam his fist holding a rock against a windshield which then breaks, I cannot report this event in answer to a question: *What happened?* as *The windshield broke*.[30] In fact, if I see a rock sail through the air and strike a windshield which then breaks, I can describe what happened with *The windshield broke* only if I do not know who threw the rock, or if I have already mentioned who threw the rock. Thus, it seems that it is more informative to mention the *ultimate* cause of a change of state, if the ultimate cause is known.

[29] I assume that the ungrammaticality of *His promise broke* receives a similar explanation. In this case, the action of the agent IS the breaking of the promise and so there is no change of state to report without the mention of the agent.
[30] This can of course be an appropriate answer to the question: *What happened to your windshield?*

In order to mention a cause, one needs to know what the cause is. As already mentioned, this is not always trivial. While we seem to have deep seated intuitions that changes of state have causes, it is not always easy, in the complex interaction of causal factors, to isolate the ultimate cause of an event. The reason that agents figure so prominently in change of state utterances and can thus be considered the prototypical cause (Croft, 1991; Lakoff, 1990; Talmy, 1976, 2000) is that an agent is typically easily isolatable as an ultimate cause. Agents also often have intentions to bring about specific changes, thus facilitating their identification as ultimate causes. For this reason, when a sentence with the anticausative variant of a verb is presented without context, speakers have a tendency to supply a causative counterpart with an agent. The Proper Containment Condition (63) descriptively captures the fact that changes of state normally brought about by the accompanied action of an agent are usually reported with a specification of the agent. This is because normally, the circumstances which allow one to report such a change of state (e.g., seeing the change of state occur) allow one to report the agent of the change of state.[31] When sentences such as *The waiter cleared the table* or *The seamstress lengthened the skirt* are heard, a speaker by default evokes a situation in which s/he sees the agent performing the action, since these changes of state cannot be caused by the agent from a distance. In such a situation, the speaker would have to mention the agent, as an identifiable ultimate cause (if the agent was not established previously in the discourse). Sentences such as *The window opened* or *The vase broke* are easier to accept because it is easy to imagine a scenario in which the speaker sees the change of state but not the act which brings it about: (i) the change of state is brought about by some cause other than an agent (e.g., by the wind), and then the cause may not be easily identifiable; (ii) the change of state is brought about by the action of an agent from a distance. But sometimes an event which is normally brought about by an identifiable agent is reported in a situation in which the speaker does not know who the agent is. Consider the situation normally described using sentences such as (21a) above (*(*)The trashcan emptied*). Normally when one sees a trash can emptying, it is accompanied by the action of an agent. But think of a trash can that has a bottom which opens by remote control and is situated over a hole. If we look at the trash can, and someone out of our view presses the button, the bottom opens and the contents of the trash can disappear from our sight, it is entirely appropriate to say *The trash can emptied*.

There are, however, some kinds of changes of state for which it is normally difficult to identify a single, isolatable cause. This is often true when the argument of the change of state receives a kind interpretation as in (43d) above (*Skirts lengthened since the sixties*). Consider (83):

(83) With the 1929 stock market crash, **skirts lengthened** but kept their narrow silhouette, with longer waistlines. http://www.ehow.co.uk/info_8066375_garden-party-gowns-1900s.html

This sentence does not report a change in the length of an individual skirt, but rather in the kind *skirt*. It reports a situation in which over the course of time, there are a variety of instantiations of the kind and when comparing them one to another over the course of time the length increases. There are probably a variety of causes (and reasons) for the gradual change in the kind, but they are likely to be diffuse and not uniquely identifiable. One can imagine a situation in which there is a conscious decision to bring about a change in the length of a skirt at a given moment in time, in which case the causative will be more appropriate:

(84) The CEO of Honigman decided to lengthen two skirts in their new line.

In this case, there is a clear identifiable cause for the change in the kind. In general, a volitional act is the most clearly identifiable cause in a causal chain, and perhaps this is the reason for an agent being the prototypical cause.

Above I illustrated uses of COS verbs which describe the change in the value of a property along a spatial – rather than temporal – axis. Sometimes these uses of COS verbs describe inherent properties of things. While it seems to be the case that we conceive of events of change of state as always having causes – even though in particular cases it may not be possible to identify the cause – this does not seem to me to be necessarily true of properties. We do not conceive of all properties as having causes, and in precisely these cases, there may be no conceivable subject for sentences expressing these properties, as in (46) and (47) above.[32] Below are similar examples:

(85) a. Her cheeks broadened as she grew older.
b. The mountain range narrows in the southern part of the state.

[31] This is particularly true for the type of causation which Talmy (1976) calls *physical causation*, i.e. where an agent engages in some physical activity to cause some physical change in another entity.

[32] Sweetser (1997) discussed many interesting examples of this sort. She suggests that the lexical anticausative is usually not appropriate for these noncanonical uses. This is an issue which deserves further attention. I thank a reviewer for drawing my attention to this paper.

6. Conclusion

In this paper, I have supported an analysis of the causative alternation in English in which all alternating verbs are lexically associated only with the internal argument(s). I suggest that in order to fully understand the alternation, one must tease apart lexical and contextual constraints on the distribution of the variants. Semantic constraints on what kinds of causes appear with which verbs in various uses are argued not to be lexically specified. A complete account must distinguish clearly between the principled availability of the two variants of a causative alternation verb and the principles governing the expression of the external cause, some of which have to do with conversational principles. I suggest that many of the nonlexical constraints on the causative alternation are best understood as resulting from principles which determine which variant of the alternation is most appropriate in a given discourse context.

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