The Causative Alternation

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Abstract

This article discusses the transitivity alternation between lexical causative verbs and their anticausative (inchoative) counterparts. It provides an overview of the semantic, syntactic and morphological properties of verbs undergoing the causative alternation, thereby identifying their cross-linguistically stable core as well as the areas of variation among languages. The main theoretical lines of analysis proposed in the literature are introduced by an exemplary discussion of accounts within lexical and syntactic frameworks of word formation. The article serves as an introduction to the research on the causative alternation as it presents important results achieved in the earlier literature, but also touches upon more recent findings and their theoretical interpretation. Finally, it addresses the aspects that still await a conclusive analysis.

1. Introduction

The causative alternation is characterized by verbs that have an intransitive as well as a transitive use, where the intransitive use typically denotes a change–of–state event undergone by some entity and the transitive use denotes that this change–of–state event has been brought about or caused by some different entity. The transitive use is therefore often paraphrased as 'cause to V-intransitive'. An example of the alternation is given in (1).

(1) a. The window broke
     b. The boy broke the window

While the intransitive sentence (1a) denotes a simple change-of-state event of the subject noun phrase 'the window', the transitive sentence (1b) expresses that 'the boy caused the window to break'. A central characteristic of this transitivity alternation is, therefore, that the subject in the intransitive use bears the same semantic relation to the verb as the object in the transitive use.

In their intransitive use, verbs undergoing the causative alternation are often called anticausative or inchoative verbs. In their transitive use, these verbs are called (lexical) causatives. Other labels for the causative alternation are, therefore, causative-inchoative alternation or anticausative alternation (sometimes also ergative alternation).

The causative alternation, which is extremely widespread − probably even universal − has been the topic of intensive research during the last decades within several different linguistic frameworks as well as linguistic disciplines. In this article, I will be concerned with semantic, syntactic and morphological aspects.[1] As is the case with verbal alternations in general, the causative alternation has been used as a probe into the organization of the mental lexicon and its interfaces with these three grammatical modules.

With respect to the organization of the mental lexicon, the debate centers on the following topic. It is generally assumed that an analysis of the causative alternation that assigns both variants an independent lexical entry is conceptually unsatisfactory; it would be really surprising that, over and over again, the same lexical element has a use as a transitive and as an intransitive verb. It follows that alternating verbs have only one lexical entry and that the two variants are derivationally related. Thus the following questions figured prominently in research on the causative alternation: Which version of the alternation is the lexical base, which one is derived, and where in the grammar is this derivation located (in the lexicon itself or in the syntax)?

From the lexical semantic side, the central topic has been whether one can determine meaning components that predict which verbs allow the alternation and which do not. Related to this are two questions: whether anticausative verbs involve causative semantics or not, as well as to what extent the class of verbs undergoing the alternation is stable across languages.

Across languages, anticausative verbs constitute a sub-class of so-called unaccusative verbs. Therefore, the causative alternation has also figured prominently in the study of unaccusativity, specifically the question of whether syntactic unaccusativity is determined by lexical semantic properties of unaccusative verbs.

Finally, while in English both versions of the alternation are morphologically identical, other languages use specific morphological devices to differentiate between the two alternates. An ultimate theory of the causative alternation should also account for the variation in the morphological marking found with the causative alternation across languages.

Before I turn to the actual discussion, let me shortly mention two phenomena that could be seen as instances of the causative alternation but that will not be handled in this article.

First, although verbs like English *cause* or *make* are often used to paraphrase the meaning of lexical causatives ('The boy broke the window' means 'The boy caused the window to break'), lexical causatives must be distinguished from these periphrastic causative constructions (which are also called syntactic causatives). These two types of causative constructions clearly differ across languages in important syntactic and semantic respects (cf., for example, Fodor 1970; Shibatani 1976; Harley 2008), which suggests that they must be kept apart. Syntactically, periphrastic causatives show a

number of bi-clausal properties while lexical causatives are clearly mono-clausal. For example, only the periphrastic causative but not the lexical causative allows different time specifications for the causing event and the caused event [cf. (2a, b)].

(2) a. John caused Bill to die on Sunday by stabbing him on Saturday.
     b. John killed Bill on Sunday by stabbing him (*on Saturday).

Semantically, periphrastic causatives can express direct or indirect causation while lexical causatives typically express direct causation. In the case of indirect causation, a further causer can intervene in the causal chain that starts with the subject of the construction and ends with the caused event [cf. (3a, b)].

(3) a. Floyd caused the glass to drop to the floor by tickling Sally, who was holding it.
     b. Floyd dropped the glass to the floor (*by tickling Sally, who was holding it).

Furthermore, the two constructions clearly differ in productivity. While lexical causatives are possible only with a restricted class of verbs to be discussed in detail below, periphrastic causatives are possible with basically all types of verbs. Periphrastic causatives thus will not be further discussed in this article.

   The second phenomenon that will not be discussed here is the following. I mentioned above that anticausatives (i.e. the intransitive alternates of the causative alternation) denote an inchoative change-of-state event as in the English example in (1). However, in some languages unergative verbs expressing an activity (such as *run*, *dance*, *laugh*, . . .) can also have a lexical-causative alternate (and in some languages even transitive verbs can have a lexical-causative alternate). A Hebrew example involving the agentive manner of motion verb '*dance*' is given below. Note that the English counterpart of (4b) is impossible ('*The musician danced him'); instead, English speakers can causativize '*dance*' only periphrastically.

(4) a. Hu rakad
         He danced
         'He danced'
     b. Ha-nagan   hirkid oto
         the-musician danced him
         'The musician made him dance'

Levin and Rappaport Hovav (1995: 113ff) argue that despite the fact that the transitive use of the verb in (4) roughly means 'cause to V-intransitive', pairs as in (4) should be kept apart from genuine instances of the causative

alternation as we saw for English in (1). As a motivation they mention that Hebrew pairs as in (4) involve derivational morphology which is invariably different from the morphology found on verbs undergoing the genuine causative alternation in this language and they report that similar findings have been made for a number of further languages. Similarly, Reinhart (2002) argues that examples as in (1) and examples of the type in (4) involve different phenomena even if they occur in one language. It must be mentioned, however, that this view is not generally accepted. For example, Doron (2003) shows that the morphological argument that Levin and Rappaport Hovav provide for Hebrew does not hold across the board and she provides a theory where examples as in (1) as well as such in (4) are basically instances of the same phenomenon.

I will not further discuss alternations of the type in (4) involving intransitive activities but I will concentrate on instances of the causative alternation in (1) where the intransitive use expresses some inchoative event (typically a change-of-state). The reason for this is that the latter type of alternation is, as mentioned above, a widespread, probably universal phenomenon, while the former type of alternation is clearly restricted to a subset of languages.[2] That is, this article concentrates on the properties of that type of causative alternation that appears to be universal. It should be kept in mind, however, that this universal pattern might only be a subset of the lexical causative alternations possible in the world's languages. The ultimate relation between the two types of alternations in (1) and (4) is an important, but yet unsettled topic.

This article is structured as follows. Section 2 discusses the core semantic and syntactic properties of the causative alternation. In Section 2.1, the causative alternation is compared with other transitivity alternations such as passives and generic middles, and it is shown that anticausatives differ in that they do not involve an implicit external argument. Furthermore, the unaccusative nature of anticausative verbs is discussed. Section 2.2 introduces the core lexical semantic properties that determine whether a verb participates in the alternation or not. Section 2.3 finally discusses the morphological variation that is found with the alternation across languages. With this background, we turn in Section 3 to the theoretical accounts proposed for the alternation. Section 3.1 discusses accounts that assume an intransitive base for the alternation, Section 3.2 discusses accounts that assume a transitive base and Section 3.3 discusses accounts that assume that both versions of the alternation are derived from a common lexical base. These three general accounts are exemplified with specific proposals of lexical and syntactic theories proposed for the alternation in the literature. Intertwined in this presentation of the theoretical accounts is a discussion of arguments for and against the assumption that anticausatives involve some causative semantics. Finally, the question of how different approaches can account for the morphological variation in the alternation is dealt with. Section 4 summarizes the discussion.

2. The Core Properties of (Anti-)causative Verbs

This section provides an overview of the core semantic, syntactic and morphological properties found with (anti-)causative verbs cross-linguistically. Many of these properties can be identified by a comparison of the causative alternation with other transitivity alternations.

2.1 ON THE RELATION BETWEEN THE CAUSATIVE ALTERNATION AND OTHER TRANSITIVITY ALTERNATIONS: CORE SEMANTIC AND SYNTACTIC PROPERTIES OF (ANTI-)CAUSATIVE VERBS

As mentioned above, the causative alternation is a transitivity alternation where the sole argument of the intransitive use bears the same semantic relation to the verb as the object of the transitive use. This property makes the causative alternation similar to other transitivity alternations, especially to the alternation between a transitive verb as in (5a) and its passive variant in (5b) or its generic middle variant in (5c).

(5) a. John read the red book
    b. The red book was read   (passive)
    c. The red book reads easily   (generic middle)

We will see that anticausatives share some properties with passives and middles; for example, anticausatives in many languages show the same morphology as passives and/or middles. But, importantly, there are clear semantic properties that set passives and middles apart from anticausatives.

From an interpretational point of view, there is the immediate intuition that both passives and middles differ from anticausatives in the presence of an external argument. Both passives and middles have an interpretation where an external argument [in (5b) and (5c) the reader of the book], although not overtly present, is nevertheless understood to be implicitly present. This intuition can be substantiated with a number of well-known tests that show that passives and middles have an implicit external argument, while anticausatives do not (Manzini 1983; Roeper 1987; Baker et al. 1989; Levin and Rappaport Hovav 1995; Reinhart 2000, among many others).

The passive optionally allows a by-phrase to make the implicit argument overt [as in (6a, b)], but anticausatives do not allow such by-phrases (6c).

(6) a. The red book was read (by John)
    b. The vase was broken (by John/by the earthquake)
    c. The vase broke (*by John/*by the earthquake)

Passives and anticausatives also differ in the licensing of purpose clauses (7a, b). The reasoning is that the implicit argument of passives can control

the covert PRO-subject of purpose clauses, but since anticausatives have no implicit argument, control fails. Similarly, passives allow agentive adverbs while anticausatives do not (8a, b).[3]

(7) a. The vase was broken [PRO to awaken a sleeping child]
     b. *The vase broke [PRO to awaken a sleeping child]

(8) a. The vase was broken (on purpose / carelessly)
     b. The vase broke (*on purpose / *carelessly)

While middles do not allow by-phrases[4] or readily license purpose clauses, they differ from anticausatives in licensing instrument PPs as in (9a) which, again, points to the presence of an implicit external argument at some level of representation (Hale and Keyser 1986). Anticausatives do not allow instrument PPs (9b).

(9) a. Potatoes peel easily with our new knife
     b. The vase broke (*with a hammer)

Furthermore, while passives and middles differ in that only the former license purpose clauses, the two pattern alike in that they can license the implicit PRO-subject of adjunct clauses (Stroik 1992; Reinhart 2000). In both (10a, b) the peeler and the boiler can be the same person, although they do not have to be. Such coreference is impossible in the anticausative (10c) which cannot mean that the children are rolled by those who put them in bed. Again, this follows if anticausatives have no implicit external argument.

(10) a. The potatoes will be peeled [after PRO boiling them]
     b. The potatoes will peel easily [after PRO boiling them]
     c. Babies often roll/turn after [PRO putting them in bed]

Such tests lead to the widely accepted conclusion that anticausatives involve no implicit external argument.[5] However, as has been stressed in the literature (e.g. Kallulli 2007; Schäfer 2008, among others), one important caveat is necessary. Most of the tests mentioned above can indicate only the absence of a specific type of implicit external argument, namely, human (or intentional) agents. This is so because non-human causers (such as natural forces) cannot license agentive adverbs, instruments or purpose clauses in the first place, even if they are the overt subject of a causative verb as in (11).

(11) The storm sank the ship (*on purpose/*with a big wave/*in order to . . .)

Therefore, these tests could be seen as suggesting that anticausatives involve an implicit external argument, but that this is necessarily a non-human

causer. Only one of the tests discussed above argues against this hypothesis. The example in (6b) showed that, in passives, the by-phrase can combine with either human agents or non-human causers. So if anticausatives involved an implicit external causer argument we would expect that this causer could be taken up in a by-phrase; since this expectation is not fulfilled in the anticausative (6c), the standard assumption in the literature that anticausatives do not involve an implicit external argument of any kind seems to be warranted. However, in Section 3.3 we will discuss some more recent findings that reopen the discussion whether anticausatives involve some causative semantics or perhaps even an implicit causer argument of some kind. But for the moment, we stay with the standard assumption in the literature that anticausatives do not involve any implicit external argument at all.

The fact that the subject of the anticausatives bears the same semantic relation to the verb as the object of the causative counterpart (both are the undergoer or theme of the event) makes anticausatives amenable to the Unaccusative Hypothesis (Perlmutter 1978; Burzio 1986). In fact, anticausative verbs are widely assumed to be the prototypical unaccusative verbs (Burzio 1986; Levin and Rappaport Hovav 1995; Chierchia 1989/2004).

According to the Unaccusative Hypothesis, intransitive verbs divide into two subclasses, unaccusatives (e.g. *fall* and *arrive*) and unergatives (e.g. *sing* and *work*). The thematic properties of the subjects of these verb classes differ. Subjects of unergatives are typically agents or initiators, thematic properties also found on subjects of transitive verbs. Subjects of unaccusatives, on the other hand, are undergoers, themes or patients, thematic roles typically found with objects of transitive verbs. The Unaccusative Hypothesis proposes that this thematic parallel is reflected by a syntactic parallel. While the sole argument of unergatives is a syntactic subject as in (12a), the sole argument of unaccusatives is base-generated as a syntactic object and moves to a derived subject position in the course of the derivation as in (12b).

(12)   a.   The boy sang   (unergative)
      b.   The vase$_i$ fell t$_i$ (unaccusative)

This movement of the NP in (12b) is traditionally assumed to happen for case reasons; verbs that have a base-generated object but no base-generated subject cannot assign accusative (a correlation referred to as 'Burzio's Generalization'). In order to pass the case filter, the object in (12b) has to move to the (derived) subject position where it can get nominative case. The same movement operation takes place in passives, too.[6]

If anticausatives are unaccusatives, then their surface subject should also be a deep structure object. Furthermore, they should pass the well known diagnostics for unaccusative verbs. Cross-linguistically, this is indeed the case. Here I mention just two well-known diagnostics from Italian, auxiliary

selection and ne–cliticization. In Italian (and other languages that have two different auxiliaries for perfect formation), transitive and unergative verbs select the auxiliary *avere* (have) while passives and unaccusatives select *essere* (be); anticausatives select *essere*, too.

(13) a. L'artiglieria **ha** affondato due navi nemiche (transitive)
the artillery has sunk two enemy ships
'The artillery has sunk two enemy ships'

b. Giovanni **ha** telefonato (unergative)
Giovanni has telefoned
'John has telefoned'

c. Maria **è** state accusata (passive)
Maria is been accused
'Mary has been accused'

d. Giovanni **è** arrivato (unaccusative)
Giovanni is arrived
'John has arrived'

e. La barca **è** affondata (anticausative)
the ship is sunk
'The ship has sunk'

Turning to the second test, the clitic *ne* (of them) can be related to the object but not to the subject of a transitive verb (14a, b). Again, the subject of unergatives patterns with the subject of transitives, while the subject of passives and unaccusatives patterns with the object of transitives (15a–c). Anticausatives also show the unaccusative behavior (15d).

(14) a. Giovanni ne inviterà molti (transitive)
Giovanni of-them will–invite many
'John will invite many of them'

b. *Ne esamineranno il caso molti
of-them will–examine the case many
'Many of them will examine the case'

(15) a. *Ne telefoneranno molti (unergative)
of-them will–telephone many
'Many of them will telephone'

b. Ne saranno invitati molti (passive)
of-them will–be invited many
'Many of them will be invited'

c. Ne arriveranno molti (unaccusative)
of-them will–arrive many
'Many of them will arrive'

d. Ne affondarono due (anticausative)
of-them sank two
'Two of them sank'

To conclude, anticausatives are a subclass of unaccusative verbs.[7] This seems to hold across languages and across the different morphological patterns found with anticausatives in languages other than English which will be discussed below.[8] The only difference between anticausatives like *break* and other unaccusatives like *fall* is then that the former have transitive alternates while the latter do not (*John fell the vase). I call the former class of unaccusatives 'alternating unaccusatives' and the latter class 'pure unaccusatives'. An important theoretical question to which we will return later is why this partition within unaccusatives exists, that is, why some but not all unaccusatives take part in the causative alternation. We would like to know whether this is an idiosyncratic property or whether there are deeper reasons for this split between alternating and non-alternating unaccusatives.

To summarize the above findings on the semantics and the syntax of anticausatives, we saw that, according to the standard tests in the literature, anticausatives differ from passives and middles in that they have no implicit external argument. Furthermore, we saw that they share at least with passives (see footnote 6 for middles) the fact that their subject is an underlying internal argument. A further similarity between anticausatives and passives and middles is the fact that in many languages two or even all three of these constructions are coded by the same morphological means (see below). Again, we would like to know whether this is coincidence or whether there are deeper reasons. But before we turn to the morphological properties of the causative alternation, we will first take a closer look at the lexical semantic properties of verbs undergoing the causative alternation.

2.2 WHICH VERBS ALTERNATE? TEASING APART THE MEANING BLOCKS OF (ANTI-)CAUSATIVES

Jespersen (1927) calls the verbs undergoing the causative alternation 'move and change verbs'. Across languages, the overwhelming number of verbs participating in the alternation denotes a change of state or a change of degree. English examples are given in (16a). A considerably smaller class of verbs taking part in the alternation comprises non-agentive verbs of manner of motion exemplified in (16b). These motion verbs could be subsumed under the notion 'change of state' if we assume that they express a change in location (Levin and Rappaport Hovav 1994).

(16) a. break, close, cool, dry, freeze, melt, open, thicken, whiten, widen, . . .
      b. bounce, move, roll, rotate, spin, . . .

Verbs expressing a change of state are often deadjectival, based on stage-level adjectives that describe properties of entities. English has two main groups of deadjectival verbs, those that are zero-derived (17a) and those that are

formed out of adjectives by the suffix '*-en*' (17b). In addition, we find change–of–state verbs derived with the verbalizers '*-ate*', '*-ify*' and '*-ize*' (17c–e), some of them being deadjectival, too. Finally, we also find a small number of psych verbs undergoing the alternation (17f) [cf. Levin (1993) for a longer list of these subclasses]. Similar word formation patterns can be found across languages.

(17) a. clear, cool, dry, dirty, empty, open, slim, thin, warm, yellow, . . .
      b. awaken, blacken, deepen, fatten, harden, lighten, quieten, soften, . . .
      c. intensify, liquefy, purify, . . .
      d. caramelize, equalize, neutralize, . . .
      e. agglomerate, dissipate, evaporate, . . .
      f. cheer, sadden, worry, . . .

Aspectually, manner of motion verbs are activities in the terminology of Vendler (1957) or Dowty (1979). Change–of–state verbs are accomplishments or achievements; they involve an end-point. The class of deadjectival change–of–state verbs falls into two aspectual subclasses depending on the type of adjective they are formed with, the relevant difference being whether the underlying adjective denotes an open or a closed scale property. Closed scale adjective (e.g. *open* and *empty*) necessarily lead to telic verbs, open scale adjectives (e.g. *wide* and *cool*) form verbs of variable telicity; the latter class of verbs is called 'degree achievements' (e.g. Dowty 1979; Hay et al. 1999; Kennedy and Levin 2008). This latter difference is not at the heart of the causative alternation and will not be discussed further.

   So far, we have constrained the verbs undergoing the causative alternation to verbs of change of state (and non-agentive verbs of motion). It follows that not all intransitive verbs have a causative counterpart, nor do all transitive verbs have an anticausative counterpart. For example, unergative activity verbs such as *laugh* do not express a change of state and do not participate in the alternation [*The clown laughed the child (intended meaning: 'The clown caused the child to laugh')].[9] Similarly, transitive activities such as *read* do not express a change of state either, and again, they do not participate in the alternation [*The book (suddenly) read]. But even within the class of change–of–state verbs (and non-agentive manner of motion verbs) the alternation is restricted. On the one hand, we find change–of–state verbs that only have an intransitive use as in (18). This is the class of pure unaccusatives mentioned in Section 2.1.[10]

(18) a. The cactus bloomed/blossomed early
      b. *The gardener/The warm weather bloomed/blossomed the cactus

On the other hand, there is a much bigger group of verbs expressing a change-of-state which can only occur as transitives and do not form anticausatives (19).

(19) a. The terrorist assassinated/murdered the president
      b. *The president assassinated/murdered

One central issue in the study of the causative alternation has been to identify those properties of change-of-state verbs that determine whether they will participate in the alternation or not. Specifically, the question has been whether we can identify meaning components which determine the behavior of individual verbs. If this were the case, the participation in the causative alternation would be determined by two semantic properties which are both necessary but which, each by itself, is not sufficient: In order to undergo the alternation a verb must first of all express a change-of-state. In addition, so the hypothesis goes, there are further meaning components associated with individual change-of-state verbs which determine the verb's behavior.

Starting with Generative Semantics, many theories have assumed that the meaning of verbs can be decomposed into some kind of lexical semantic representation that is made up by a limited set of basic event predicates and a lexical core (Lakoff 1968; McCawley 1968; Jackendoff 1976; Dowty 1979; Hale and Keyser 1987, 2002; Pinker 1989; Parson 1990; Pustejovsky 1995; Wunderlich 1997; Marantz 1997; Van Valin and LaPolla 1997; Levin and Rappaport Hovav 1995, 1998; Travis 2000; Borer 2005; Ramchand 2008, among many others).[11] While individual theories differ in the exact nature of predicates used and, especially, in the assumption about where in the grammar the decomposition occurs (see below), such theories share the assumption that decomposition allows us to capture different aspects of verbal meaning that determine different types of grammatical behavior.[12]

The decomposition into basic event types is often referred to as 'event structure'. Event structures can be simple, made up from one basic predicate, or complex, made up by a composition of basic event predicates. The result is a small set of possible event structures defining aspectual verb classes. The lexical core expressing idiosyncratic aspects of verbal meaning is nowadays called a 'constant' or 'root'. Different verbs might have the same event structure but they involve different lexical roots.

Above we formulated the hypothesis that the causative alternation is constrained by two lexical-semantic restrictions. Event decomposition allows us to tease apart these two restrictions. The idea is that change-of-state verbs share the same event decomposition but differ in their lexical core. The lexical core contains idiosyncratic meaning that determines whether a change-of-state verb alternates (e.g. *break*), must necessarily be intransitive (e.g. *blossom*) or must be transitive (e.g. *murder*).

Change-of-state verbs are assumed to have a complex event structure as in (20a, b). Intransitive change-of-state verbs involve a result state predicated over the theme and a BECOME predicate that takes a resultant state as its argument. Transitive change-of-state events have, in addition, a CAUSE predicate that takes the BECOME predicate as one argument and also introduces a causer argument.[13,14] The presence of the result state reflects that change-of-state events are accomplishments or achievements.[15]

(20) a. [BECOME [y <STATE>]]
      b. [x CAUSE [BECOME [y <STATE>]]]

The result state in (20) is filled by the lexical core of the individual change-of-state verb.[16]

Motivation for such a complex event structure comes from the ambiguity of certain adverbs like '*again*' (McCawley 1968; Dowty 1979; von Stechow 1995, 1996). The example (21a) is ambiguous between a so-called *restitutive* reading and a so-called *repetitive* reading. The latter reading presupposes the existence of a previous time at which the door changed from being closed to being open while the former reading just presupposes that there is a previous time at which the door was open but not that there was a previous opening event. Assuming the event decomposition proposed above, we can understand these two readings as a scope ambiguity. Under the *restitutive* reading, the adverb *again* scopes just over the resultant state of the door as illustrated in (21b). Under the *repetitive* reading, the adverb takes scope over the whole change-of-state event as in (21c).

(21) a. The door opens again
      b. [BECOME (*again* [the door <OPEN>])]
      c. (*again* [BECOME [the door <OPEN>]])

The same ambiguity appears with the transitive version of *open* in (22a). Under the *restitutive* reading, the subject causes the door to return to its previous state of being open; no further opening event is presupposed [cf. (22b)]. Under the *repetitive* reading, the subject opens the door and it is presupposed that he had done this before [cf. (22c)]. (Note that the decomposition predicts a third reading where the adverb scopes between CAUSE and BECOME; we will come back to this later.)

(22) a. He opens the door again
      b. [he CAUSE [BECOME (*again* [the door <OPEN>])]]
      c. (*again* [he CAUSE [BECOME [the door <OPEN>]]])

As already mentioned, theories differ as to the status they attribute to such representations. Specifically, some assume that they are part of the lexical entry of verbs, others take them to be basically syntactic (see below). In

the latter case, the fact that causers are external arguments and undergoers of change-of-state events are internal arguments easily follows because the layered event structures in (21/22) are actually syntactic structures. In lexical accounts (e.g. Levin and Rappaport Hovav 1995; Reinhart 2000, 2002), so called 'linking rules' make sure that the undergoer of a change-of-state event becomes the internal argument in syntax while the causer becomes the external argument.

Since not all change-of-state verbs alternate, the question has been whether we can identify meaning components that determine this property. Actually, the question has two sides to it, namely, what meaning component of necessarily transitive change-of-state verbs prohibits an intransitive version and what meaning component of necessarily intransitive change-of-state verbs prohibits a transitive version. It turns out that such meaning components can indeed be identified, at least for the first problem (Smith 1970; Hale and Keyser 1986; Levin and Rappaport Hovav 1995; Reinhart 2000, 2002).

The central property seems to be whether the idiosyncratic meaning part of a verb (the core or the root) specifies the nature of the causing sub-event or not. One verb often discussed in this context is the verb *cut*. This verb does not form an anticausative (*The bread cut). As observed by Hale and Keyser (1986), the meaning of *cut* specifies not only a resultant state ('linear separation in the material integrity of an object') but also a manner component which says that the change of state is the result of the use of some sharp instrument. The use of an instrument, in turn, suggests that a human agent is involved. Indeed, the subject of transitive *cut* can only be a human agent or an instrument but not a natural force (cf. 23) (but see footnote 17).

(23)   a.   The baker/the knife cut the bread
       b.   *The lightning cut the clothesline

Similarly, a verb like *murder* implies a causing event involving intention. And again no natural force can murder someone. Following observations in Smith (1970), Levin and Rappaport Hovav (1995) and Reinhart (2000, 2002) generalize these findings. Levin and Rappaport Hovav conclude that causatives that restrict their external argument to agents (or agents and instruments) and disallow causers cannot form anticausatives. Reinhart states that only those causatives that leave the nature of their external argument unspecified form anticausatives. The examples in (24)–(27) illustrate these findings.

(24)   a.   The vandals/The rocks/The storm broke the window
       b.   The window broke

(25)   a.   John/The hammer/The storm enlarged the hole in the roof
       b.   The hole in the roof enlarged

(26)   a.   The terrorist assassinated/murdered the senator
  b.   *The explosion assassinated/murdered the senator
  c.   *The senator assassinated/murdered

(27)   a.   John removed the sand from the rocks
  b.   *The wind/The water removed the sand from the rocks
  c.   *The sand removed (from the rocks)

It is interesting to note in this context that verbs that are derived from adjectives describing a physical state typically undergo the causative alternation across languages. This confirms the idea that the relevant meaning component determining the behavior of a verb is located on the lexical core or root of the verb. Obviously, adjectival cores can only constrain the result state but not the event causing the result state; therefore, the latter is not obligatory.

On the other hand, Levin and Rappaport Hovav make it clear that the relevant information is not necessarily about the verb or the root itself but about the eventuality expressed with the help of the verb. They observe that the alternation is also restricted by the kind of theme argument the verb takes. For example, while *break* in principle alternates, the anticausative examples in (28b) are out. That is, intransitive *break* shows stronger selectional restrictions on its theme than transitive *break* (for more examples of this kind, see Levin and Rappaport Hovav (1995)).

(28)   a.   He broke his promise/the contract/the world record
  b.   *His promise/The contract/The world record broke

The explanation for such data is that, by world-knowledge, the eventuality described in (28) necessarily involves an intentional agent (cf. *The bad weather broke the promise).

Concerning intransitive verbs without transitive counterpart (*bloom*, *blossom*, . . .), there are two possible solutions. Chierchia (1989/2004) and Reinhart (2000, 2002) claim that most such verbs have transitive counterparts in some language. If a transitive counterpart is missing in some language, it is just a lexical gap that this form does not surface. Levin and Rappaport Hovav (1995) attribute to these verbs a different semantic property which explains why they do not have transitive counterparts (the notion of 'internal causation' to be discussed below).

The generalization exemplified in (23)–(28) is of astonishing cross-linguistic accurateness. However, it is not perfect. On the one hand, some languages have a very small class of alternating verbs that restrict their external argument to causers and exclude agents in contrast to the formulation of the generalization used by Reinhart (2000, 2002). German examples are *anwehen* (to drift/blow up to) or *anschwemmen* (to wash ashore), the former taking subjects like *wind*, the latter subjects like *river* (Torgrim Solstad personal communication).

Furthermore, some languages have a somewhat larger group of verbs that allow agents, instruments or causers as subject but, nevertheless, do not form anticausatives. English examples are *kill* or *destroy*. German has in addition the verb *erschlagen* (strike dead) and *zerkleinern* (to reduce to small pieces) (see Härtl 2003). One possibility is that these missing anticausatives are just lexical gaps as proposed by Reinhart (2000, 2002). Alternatively, leaving agentivity aside, there could be other meaning components associated with these verbs that make the anticausative use impossible. This proposal was investigated for German *zerstören* (destroy) by Härtl (2003). If this solution is correct (as also suggested by Alexiadou et al. 2006), then the question is why some languages are more flexible and allow the anticausative use of *destroy*, *kill* and also *cut*[17] [e.g. Greek, Hindi; see Alexiadou (forthcoming)]. Again, two options are conceivable. Either such verbs do not mean exactly the same in these two groups of languages (Davis and Demirdache 2000) or the more flexible group of languages has some morphosyntactic way to circumvent some restrictions that prohibit anticausative formation in the other class of languages (Alexiadou et al. 2006 and Alexiadou forthcoming).

Three further challenges to the generalization should be mentioned in passing. Some languages restrict their external arguments to agents and never license causers. This is reported about Jacaltec in Craig (1976) and for Japanese in Yamaguchi (1998). Nevertheless, these languages have the causative alternation. Similarly, it has been reported for Greek (Alexiadou et al. 2006), Hebrew (Doron 2003) and Icelandic (Jónsson 2003) that transitive causative verbs allow causer subjects, while the passive of these verbs does not allow causers in the by-phrases (see Alexiadou et al. 2006 for a proposal of how such languages could be made compatible with the above generalization). Moreover, at least in German, manners of motion verbs like *rollen* (roll) alternate but do not allow causer subjects (Schäfer 2008).[18] Finally, some languages seem to have lexical causative counterparts of verbs of existence and appearance (see Davis and Demirdache 2000 for Salish, Reinhart 2000 for Hebrew, Volpe 2007 for Japanese). To the extent that these transitive uses allow only agent subjects (as I suggest), they might be problematic for the above generalization. However, Levin and Rappaport Hovav (1995) argue against the view that the phenomenon in Hebrew is an instance of the causative alternation. The status of this verb class remains unsettled.

2.3 MORPHOLOGICAL MARKING AND MORPHOLOGICAL VARIATION

So far we have mainly looked at English verbs undergoing the causative alternation. There, the two versions of the alternation differ only in the number of arguments they take. Cross-linguistically, however, the causative alternation shows a lot of morphological variation in whether one of the two versions or even both are marked by specific morphological

devices, as I briefly exemplify below. A more detailed overview over this variation can be found in Haspelmath (1993) (see also Piñón 2001; Doron 2003 for discussion).

In many languages, the anticausative variant is marked by special morphology while the causative variant remains unmarked. Polish, for example, marks anticausatives with a reflexive clitic.

(29) złamać-się   'break (intr)'
     złamać   'break (tr)'

Other languages mark the causative variant of the alternation. Below an example from Khalka Mongolian is given.

(30) ongoj-x   'open (intr)'
     ongoj-lg-ox   'open (tr)'

In some languages, both variants are morphologically derived from a common stem with the help of specific morphology. Japanese is an example (this types of marking is called *non-directed* or *equipollent* by Haspelmath 1993).[19]

(31) atum-aru   'gather (intr)'
     atum-eru   'gather (tr)'

Certainly, a full account of the causative alternation must explain why we find this variation in morphological marking. One hypothesis that I will briefly touch upon below is that the marking of one of the pairs reflects the direction of derivation.

If we concentrate on languages that mark the anticausative version of the alternation, two further typological observations can be made. While some of these languages mark all anticausatives the same way (e.g. Polish), other languages mark only a subset of their anticausatives and leave the rest of their anticausatives unmarked.[20,21] This is, for example, the case in the Romance languages, in German and Dutch and also in Greek. These languages have a set of marked anticausatives and a set of unmarked anticausatives, the latter identical in morphology to the causative variant. Below, I illustrate this for Italian and Greek. In Italian, some anticausatives must occur with the reflexive clitic '*si*', while other anticausatives remain necessarily unmarked (Centineo 1995, Folli 2003).

(32) a. La   finestra   *(si)   è   chiusa
      the   window   REFL is closed
      'The window closed'
   b. La   temperatura (*si) è diminuita
      the   temperature REFL is decreased
      'The temperature decreased'

In Greek, some anticausatives must occur with non-active (NACT) morphology, while others must occur unmarked, that is, with active morphology.

(33) a. I   supa   keg**ete**
          the   soup.NOM   burns.NACT
          'The soup is burning'
      b. I   sakula   adias**e**
          the   bag.NOM   emptied.ACT
          'The bag emptied'

Such morphological splits pose interesting questions. To what extent do such splits in different languages reflect the same phenomenon? Is the split just a case of allomorphy or does it reflect deeper differences between two classes of anticausatives? At which level of grammar is the marking located, that is, is it established in the lexicon, or is it associated with some position in the syntactic tree? Is there a relation between meaning and morphological marking? Specifically, are there ways to relate some lexical meaning component of the anticausative verbs or some conceptualization associated with these verbs to the presence or the absence of the morphological marking? Finally, does the presence vs. absence of anticausative morphology interact with semantic or syntactic properties at the sentence level? Such questions have not been investigated extensively up to now.

Some lexical frameworks relate the marking of anticausatives to a process of detransitivization. Since they assume that all anticausatives are derived from their transitive counterpart by detransitivization, the presence vs. absence of anticausative morphology is typically taken to be an idiosyncratic instance of allomorphy (Levin and Rappaport Hovav 1995; Reinhart 2000; Chierchia 1989/2004). That the morphological variance in the class of anticausatives is a case of contextual allomorphy has also been suggested by Embick (2004a) within a syntactic account of word formation, which does not build on derivational operations but on syntactic decomposition (cf. also Lidz 2004).

Haspelmath's (1993) typological study suggests that the split morphological marking of anticausatives as well as causatives (the latter not exemplified here) can be explained by building on the concept of iconicity at a relatively abstract level of conceptualization.[22] According to him, there exists a universal ranking of predicates along a 'spontaneity scale'. Verbs at the one end of the scale express events that are more likely to occur spontaneously, that is, without an external causing entity, than verbs at the other end of the scale. He argues that if a language marks a transitive verb with morphology, this language will also mark all other transitives that express events of equal or higher spontaneity. Correspondingly, if a language marks an intransitive verb with morphology, this language will mark all other intransitives that express events of equal or lower spontaneity. To

make this more concrete, the idea is that the marked anticausatives in (32a, 33a) express events of lower spontaneity than the unmarked anticausatives in (32b, 33b). If a verb of lower spontaneity is used as an anticausative, some morphological marking is added to compensate the non-expression of the external argument.

A number of authors have claimed for individual languages that the morphological split within anticausatives is associated with semantic effects. For example, Alexiadou and Anagnostopoulou (2004) investigate the relatively small class of Greek anticausatives that are optionally marked with active or non-active morphology and argue that the choice of morphological marking has an effect on the aspectual interpretation of these verbs. With the active form, these verbs denote a partial, incomplete change, with the non-active form they may (but do not have to) denote a change of state that takes place completely. This is illustrated by their example in (34). In the first conjunct, which states that the change of state is partial, the active form can be used. In the second conjunct, where a complete change is asserted by the adverb *entelos* (completely), only the non-active from is licit and the active is ruled out; this shows that the active form is not compatible with a complete change of state.

(34)　To ktirio　　　gremise　　　　se ena simio
　　　the building　collapsed.ACT　in one spot
　　　alla　　　　den　　　　gremistike/*gremise　　　entelos
　　　but　　　　NEG　　　　collapsed.NACT/*ACT　　completely
　　　'The building collapsed in one spot, but it did not collapse completely'

Similar effects have been reported for Romance languages. Folli (2003) claims that choice of the morphological paradigm has aspectual effects in Italian. To illustrate this, I concentrate here on the small class of verbs that can optionally occur unmarked or marked by the clitic *si*.[23] The choice of the reflexive clitic *si* forces a telic interpretation that is only possible but not forced in the absence of the clitic. This is illustrated below with the modification with temporal adverbials. Unmarked anticausatives can occur both with 'in X' and 'for X' adverbials (35a). Marked anticausatives cannot occur with 'for X' adverbials (35b).

(35) a.　Il　cioccolato è　　fuso　per　　pochi secondi/in pochi　　secondi
　　　　the chocolate　is　　melted for　　few　seconds/in few　　　seconds
　　　b.　Il　cioccolato *si*　è　　fuso　*per pochi　　secondi/in pochi　secondi
　　　　the chocolate　REFL is　　melted for　few　　　seconds/in few　　seconds
　　　　'The chocolate melted for a few seconds/in a few seconds'

For French, similar, though less strict, effects were noted by Zribi-Hertz (1987) and Labelle (1990, 1992).

It must be stressed that the question whether there exist semantic differences between two morphological classes of anticausatives has to be asked for every individual language; that is, neither have such differences been identified for all languages with two morphological classes of anticausatives, nor are the semantic effects in individual languages necessarily related or even identical.[24] However, to the extent that such semantic differences between marked and unmarked anticausatives in one language are real and consistent for verbs of the two morphological classes, they call into question a pure morphological analysis of such splits as cases of allomorphy. Instead they suggest that different syntactic or semantic structures are involved.

The cross-linguistic typology of the morphological marking of anti-causatives poses a further theoretical challenge. Not only do we find similar classes of anticausative markers (typically reflexive or non-active morphology) across languages, but the morphology used to mark anticausatives is typically also used for further purposes. Specifically, we find the same morphology in addition to anticausatives in (a subset of) the following three constructions (cf. Geniušiene 1987; Haspelmath 1990; Klaiman 1991; Kemmer 1993):

(i)   inherently reflexive verbs [e.g. verbs of body care (*wash*, *comb*) and naturally reciprocal events (*meet*, *kiss*)]
(ii) generic middles
(iii) passives

This poses the following questions: what do these semantically quite different phenomena have in common that would explain why they are marked with the same morphology?[25] And what do reflexive and non-active morphology have in common that qualifies them both as markers of these constructions?

These questions are far from settled. Within lexicalist approaches, it has been proposed that these different constructions are derived by the same or similar detransitivization operations (e.g. external vs. internal argument reduction, Chierchia 1989/2004; Reinhart 2000, 2002; Reinhart and Siloni 2005). Within syntactic accounts, it has been proposed that these constructions share some common syntactic substructure, specifically a formally unaccusative structure with no overtly projected external argument (e.g. Marantz 1984; Embick 2004a; but see Reinhart and Siloni 2004 for criticism of this view). This substructure gets realized by an exponent which is underspecified for other differences between the constructions (e.g. whether an implicit external argument is present or not). Still, both types of theories need to explain in what sense reflexive or non-active morphology (but not some other device) qualifies as a marker of reduction operations or unaccusative syntax.

3. Theoretical Accounts of the Causative Alternation

As mentioned in the Introduction, it is generally agreed on that verbs undergoing the causative alternation involve only one lexical entry and that the two variants are derivationally related. Thus, the question of which one of the two versions is basic and which one is derived has figured most prominently in research on this alternation. A further controversial question has been where in the grammar such lexical derivations take place. Concerning the latter question, two accounts have been proposed, lexicalist and syntactic accounts of word formation (with many variations within each of the two camps and also accounts which combine assumptions of the two).

Lexicalist accounts assume that syntactic structure is projected from the lexicon. The lexical entry of a verb comprises not only idiosyncratic information but also more structural facets of meaning such as event structure and argument structure. In addition, there exist lexical operations that can work on and modify lexical entries. Argument structure alternations such as transitivity alternations are derived in the lexicon by such operations. A set of linking rules then places the lexical arguments of the verb into different positions in the syntactic tree.

Syntactic accounts restrict all structure changing effects to the syntax. Argument structure alternations such as transitivity alternations must, therefore, be the result of syntactic structure interacting with the basic verbal element. Recent strong versions of the syntactic account are so-called neo-constructionist theories that restrict lexical entries to their core idiosyncratic meaning, the 'root'. All other meaning components associated with verbs such as event structure, argument structure or thematic roles result from the syntactic (sub-)structures where a root and the arguments of a verb are inserted. Crucially, no structure-changing operations are possible in the lexicon, as the lexical entries do not involve structured information in the first place. Instead, argument structure alternations such as transitivity alternations are the result of different syntactic structures in which a lexical root is inserted. Structure building is in principle free but the result must be compatible with general encyclopaedic knowledge associated with lexical roots.

Concerning the question of which variant in the causative alternation is basic and which one is derived, there are two obvious solutions and both have been proposed. According to one view, alternating verbs are basically monadic predicates. The causative alternant is derived from the anticausative/inchoative via causativization (Section 3.1). According to the second view, alternating verbs are basically dyadic predicates. The anti-causative alternant is derived from the transitive one via a process of detransitivization (Section 3.2). More recently, however, a third option has been suggested, according to which both versions are derived from a common source (Section 3.3). I will discuss these general proposals in turn on the basis of certain concrete implementations.
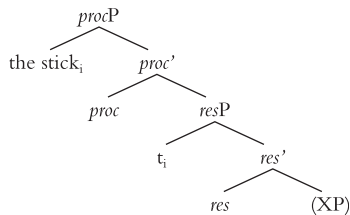
3.1 'intransitive base' approaches

The standard approach to the causative alternation was that the transitive entry is derived from the basic anticausative/unaccusative entry via a process of causativization (Lakoff 1968, 1970; Dowty 1979; Williams 1981; Hale and Keyser 1986, 1987; Brousseau and Ritter 1991; Harley 1995; Pesetsky 1995, among many). Lexical as well as syntactic versions of this idea have been proposed.

In lexicalist theories, the operation of causativization adds a causative predicate to the lexical representation of the anticausative base. For example, in Hale and Keyser (1986, 1987), lexical entries are organized in a so-called lexical conceptual structure (LCS). Alternating verbs such as *break* have an intransitive entry as in (36a), which can be altered by the lexical operation of causativization that embeds the basic LCS under a CAUSE predicate introducing the external argument variable as in (36b). Depending on which LCS is projected to syntax, an anticausative or a causative verb results.
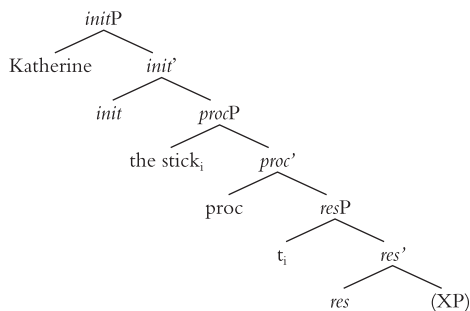
(36)   Causativization rule in Hale and Keyser (1986)
   a   basic LCS of *break*:   [BECOME *BROKEN* (x)]   ➔
   b.   derived LCS of *break*:   [(y) CAUSE [BECOME *BROKEN* (x)]]

The causativization analysis can be reformulated in syntactic terms. Following Larson (1988), the verbal phrase can be split into several layers of verbal projections, each of them providing a specifier to merge an argument. These verbal layers are combined by cyclic head-movement of the lowest verbal head. Syntactic accounts of word formation assume that verbs with a complex event structure are syntactically decomposed into different verbal layers expressing more basic, atomic events and introducing arguments. The difference between unaccusatives/anticausatives and causatives results then from the presence vs. absence of a verbal layer projected by a head expressing causation and introducing the external argument. Such an analysis has, for example, been proposed in Harley (1995), Pesetsky (1995), Chomsky (1995, Chapter 4) or more recently in Folli (2003), Folli and Harley (2005) or Ramchand (2008). Ramchand decomposes change-of-state verbs into the verbal layers *init*(iation)P, *proc*(ess)P and *res*(ult)P (which very roughly correspond to the predicates CAUSE, BECOME and STATE, respectively). Specifically, she assumes that anticausatives are basic as in (37a). The theme is first merged in the specifier of *res*P and moves afterwards to the specifier of *proc*P. Thereby it acquires a complex θ-role of both a RESULTEE and an UNDERGOER of the event. Causatives are derived in the syntax by addition of a default *init*-head expressing causation and introducing the external argument (the INITIATOR) as in (37b). In English, this head is morphologically zero.

(37) a. The stick broke

```
                procP
          ┌───────┴───────┐
     the stickᵢ          proc'
                    ┌──────┴──────┐
                  proc          resP
                          ┌───────┴───────┐
                         tᵢ             res'
                                   ┌──────┴──────┐
                                 res          (XP)
```

b. Katherine broke the stick

```
                 initP
           ┌───────┴───────┐
       Katherine         init'
                    ┌───────┴───────┐
                  init            procP
                            ┌───────┴───────┐
                       the stickᵢ         proc'
                                    ┌───────┴───────┐
                                  proc           resP
                                           ┌───────┴───────┐
                                          tᵢ             res'
                                                    ┌──────┴──────┐
                                                  res          (XP)
```

Von Stechow (1995, 1996) has explicitly argued that event decomposition must happen in the syntax, because word order (i.e. syntax) has an influence on the interpretation of adverbs such as *again* (but see Jäger and Blutner 2000 for criticism). Recall that *again* can have a repetitive or a resultative reading in change–of–state contexts such as (38a). But topicalization of the adverb prevents the *restitutive* reading; only the *repetitive* reading is possible in (38b). (Von Stechow shows that similar effects occur in German under scrambling of the theme DP over the adverb.)

(38) a. John opened the door again   (repetitive or restitutive)
      b. Again, John opened the door   (only repetitive)

According to von Stechow, (38a) is ambiguous because *again* could either be attached low, c-commanding and scoping just over *resP* in (37b) or high, scoping over all verbal heads. In (38b), however, the adverb is in a position where it necessarily scopes over all verbal heads.

We saw in Section 2.3 that some languages mark the transitive version of the causative alternation with extra morphology. Theories assuming causativization can easily account for this. Lexicalist theories can assume that in some but not all languages the lexical derivational operation of causativization is morphologically reflected. Syntactic theories can assume that the causative verbal head has a morphological exponent in these languages.

However, such theories are challenged by languages that mark (a subset of) their anticausative alternants, as these are assumed to be basic, that is,

not derived (but see Harley 1995 or Folli 2003 for various proposals). This problem becomes even more acute, as non-alternating unaccusative verbs (such as English *blossom*) appear more often than not without any morphological marking in these languages. Since unaccusative verbs and anticausative verbs are assumed to be structurally identical, this difference cannot be captured.

Finally, in order to account for the fact that not all change-of-state verbs alternate, the process of causativization must be restricted. For necessarily transitive verbs, the process must be obligatory, for alternating verbs it must be optional and for non-alternating unaccusatives it must be prohibited. Leaving details aside, Hale and Keyser (1986) as well as Ramchand (2008) take these kinds of restrictions to be of encyclopaedic nature but coded in the lexical entry of a verb. That is, even in the account by Ramchand (2008), there is a lexical residue that determines that an English verb like *murder* obligatorily occurs in a transitive (i.e. causativized) syntactic structure.

3.2 'TRANSITIVE BASE' APPROACHES

The opposite direction of derivation has been proposed, for example, by Grimshaw (1982), Chierchia (1989/2004), Levin and Rappaport Hovav (1994, 1995) and Reinhart (2000, 2002). All of these theories are lexical in nature but, nevertheless, differ substantially in how they account for the derivation of anticausatives, especially in whether anticausatives still involve causative semantics.[26] On the morphological end, such accounts face exactly the opposite challenge as approaches assuming causativization. Since anticausatives are assumed to be derived from a causative variant, the morphology found on anticausatives can be seen as a marker of a derivational process. But this time the problem is how to account for languages that mark (a subset of) their causative alternants.

3.2.1 Detransitivization and Reduction
Grimshaw (1982) assumes a lexical operation of detransitivization that does exactly the opposite of the causativization operation discussed above. The causative version is basic and the operation of detransitivization (or inchoativization) deletes the CAUSE predicate from the lexical conceptual representation.

(39) detransitivization rule
      causative: [(x) CAUSE [BECOME *BROKEN* (y)]]   ➜
      anticausative: [BECOME *BROKEN* (y)]

Under such an account similar problems or questions arise as under the causativization approaches. First, since intransitive change-of-state verbs without a causative counterpart (*blossom*) would not have a source from which they could be derived, such verbs must be listed as basically intransitive entries

or they must be marked so that the detransitivization operation is obligatory. Furthermore, the detransitivization operation must be restricted since not all transitive change–of–state verbs can form anticausatives. Finally, one would like to know why anticausatives are so often marked with non–active or reflexive morphology and not some different device.

Reinhart (2000, 2002), inspired by Chierchia (1989/2004), discussed in the next section, develops a detransitivization analysis which differs in terms of implementation. Her 'Theta System' does not build on event decomposition but, instead, assumes that lexical entries encode θ-relations between a verb and its arguments. Theta roles of arguments are encoded by two binary features. Furthermore, the lexicon provides so called 'arity operations' that manipulate lexical entries. Finally, linking mechanisms map arguments to syntax according to their θ-composition.

The two binary features relevant for the decomposition of θ-roles are [+/−c], expressing whether the argument in question is responsible for causing the verbal event and [+/−m], expressing whether the mental state of the argument is relevant in the verbal event. These features can occur alone as well as in combination. Human agents are coded as [+c, +m], themes as [−c, −m]. The coding [+c] is underspecified for [+/−m] and therefore compatible with both human agents and non-human causers.

Two operations can manipulate lexical entries. 'Saturation' derives passives via existential binding of the external argument. 'Reduction' eliminates either the external or the internal argument. Inherent reflexives are derived from transitive entries via internal argument reduction. Anticausatives are derived from transitive entries via external argument reduction (also called 'expletivization'). Crucially, the external argument can only be reduced if it is [+c], that is underspecified for the contrast between agents and causers (as well as instrument). This restriction is intended to derive the observations made in Section 2.2; a verb like *murder* has an external argument coded as [+c, +m] so that reduction cannot apply.

Reinhart further proposes that all unaccusatives are actually derived from transitive counterparts. If an unaccusative verb does not have a transitive counterpart in a language, this transitive counterpart is meant to 'be frozen'; it can feed lexical operations but is never inserted to syntax.

3.2.2 Reflexivization

Chierchia (1989/2004) proposes an analysis of the causative alternation that takes seriously the fact that we so often find reflexive morphology on anticausatives. (He does not discuss languages with non–active morphology). His proposal is that anticausatives are basically transitive and the unaccusative variant is derived by a process of reflexivization. Reflexivization (R) is an operation that takes a relation as its argument and sets the two arguments of the relation to be identical with one another (cf. 40).

(40)   R (verb) (x) $\leftrightarrow$ [verb (x)] (x)

When applied to causative verbs, it takes the relation between two arguments x and y in (41a) such that some action or property P of y causes $\alpha(x)$ and returns (41b) where the external argument and the internal argument are set to be identical. For unaccusative formation, a special form of reflexivization is needed, 'internal reflexivization', which leaves behind the internal argument.

(41) a. $\lambda x \; \lambda y \; \exists P \; [\text{CAUSE P (y)}, \alpha(x)]$
      b. $\lambda x \; \exists P \; [\text{CAUSE P (x)}, \alpha(x)]$

Under this analysis, anticausatives are actually interpreted as causatives. Specifically, Chierchia proposes to interpret the causing factor statively, so that (41b) means 'a property of the theme causes the theme to undergo a change of state.'

This analysis has the clear benefit that it tries to make sense out of the reflexive morphology often found with anticausatives. That is, not only do we understand why anticausatives are marked (they are derived) but also why they are marked by reflexive morphology; in the case of anticausatives, reflexive morphology does the same that it always does, it reflexivizes.

Chierchia proposes that in cases where no such reflexive morphology can be found 'the reflexive operator is lexically incorporated into the meaning of the verb without any morphological reflex' (Chierchia 2004: 42). He also argues that unaccusatives with no transitive alternate are derived from some abstract transitive verb which is frozen (cannot occur in this language for idiosyncratic reasons; see Pustejovsky 1995 and Reinhart 2000, 2002 discussed above). Chierchia does not discuss the restriction that necessarily agentive change-of-state verbs do not have an anticausative variant. Koontz-Garboden (2007, 2009 forthcoming) develops an updated version of the reflexivization account that is intended to derive exactly this; he also gives an interesting new argument in favor or a reflexivization account to anticausatives.

The reflexivization account to anticausatives is not without problems. On the morphological side, recall that many languages use the same morphological marking found on anticausatives also for other voice phenomena, such as generic middles or passives; it remains to be shown that these other voice phenomena can also sensfully be reduced to reflexivization. But the semantic side of the reflexivization account has also been argued to be problematic. A number of researchers (e.g. Piñón 2001; Doron 2003; Folli 2003) have questioned the claim that an anticausative sentence such as 'the boat sank' means something like '(some property of) the boat sank the boat'. Such semantics becomes even more implausible in examples such as 'The wound healed within two weeks'.[27]

Chierchia argues that the licensing of the Italian phrase *da sé* (by itself) provides evidence for his analysis. He claims that the antecedent of *da sé*

'must be construed as the sole cause of the event under consideration' (Chierchia 2004: 42). Since anticausatives allow *da sé*, with the theme as the antecedent, he concludes that this theme is also the causer of the event.

(42) La   porta si   è aperta *da sé*
     the door REFL is opened by self
     'The door opened by itself'

But once again, such examples do not seem to express something like '(a property of) the ship itself sank the ship' (Piñón 2001; Folli 2003). Instead, it seems that usage of *da sé* and its counterpart in other languages *denies* that a causer of the change-of-state event can be identified (cf. Reinhart 2000; Pylkkänen 2002, 2008; Alexiadou et al. 2006).[28,29] Furthermore, *da sé* phrases are not restricted to (anti-)causative verbs, as claimed by Chierchia, but occur with other verbs as long as the context suggests that the event expressed by the verb could, in principle, be caused (linguistically, for example, via periphrastic causation). In (43a), we find an Italian example with a manner of motion verb (from Folli 2003); in (43b) we find a German example with the eventive copula '*werden*' (become) (from Schäfer 2008).

(43) a. Gianni ha   camminato da sé
        John   has   walked   by self
        'John walked by himself'
     b. Das   wird   von   selbst   deutlich
        this   becomes   by   self   clear
        'This becomes clear by itself'

3.2.3 Lexical Binding
Levin and Rappaport Hovav (1995) propose that all verbs undergoing the causative alternation are inherently transitive and have the causative lexical–semantic representation (LSR) in (44a). Intransitive change–of state verbs that do not have a transitive version (*blossom*, *decay*, . . .), on the other hand, have the LSR in (44b).

(44) a. [x DO-SOMETHING] CAUSE [y BECOME <STATE>]]
     b. [y BECOME <STATE>]]

They call verbs with the LSR in (44a) 'externally caused verbs' and verbs with the LSR in (44b) 'internally caused verbs'. Verbs of the former class are meant to 'imply the existence of an "external cause" with immediate control over bringing about the eventuality denoted by the verb' (Levin and Rappaport Hovav 1995: 92). With verbs of the latter class 'some property inherent to the argument of the verb "is responsible" for bringing about the eventuality' (Levin and Rappaport Hovav 1995: 92). While some externally caused verbs can leave the causer unexpressed, Levin and

Rappaport Hovav (1995: 93) claim that even then 'our knowledge of the world tells us that the eventuality these verbs describe could not have happened without an external cause.'

An externally caused verb can leave its external argument unexpressed only if the eventuality expressed by the verb can come about without the intervention of an agent, that is, if the verb can take agents, instruments or causers as external argument. Only in this case a detranitivization process called 'lexical binding of the external argument' can take place. This derives the verb restrictions as well as the selectional restrictions discussed in Section 2.2.

Consider the alternating verb *break*. In its transitive use, both arguments are first projected from LSR to Argument Structure (AS) (mediated by linking rules) and afterwards from argument structure to syntax (cf. 45). In the intransitive use, the external argument is lexically bound in the mapping from LSR to AS and is thus prevented from being projected into the syntax (cf. 46).[30]

(45) Transitive '*break*':

LSR	[[x DO-SOMETHING] CAUSE [y BECOME *BROKEN*]]
Linking rules	↓ ↓
AS	x \<y\>

(46) Intransitive '*break*':

LSR	[[x DO-SOMETHING] CAUSE [y BECOME *BROKEN*]]
	↓
Lexical binding	∅
Linking rules	↓
AS	\<y\>

Levin and Rappaport Hovav provide two supporting arguments for their proposal. First, they follow Chierchia (1989/2004) in the assumption that Italian *da sé* and English *by itself* signal the causative semantics in anticausatives. Specifically, they suggest that these phrases take up the cause argument present at the level of LSR and identify it as the theme. But this proposal leads to the same problems that we discussed in the last section in connection with Chierchia's account of *da sé*. However, in the final section we will see further arguments in support of the claim that anticausatives involve causative semantics; these findings are, in principle, compatible with their account.

Second, Levin and Rappaport Hovav claim that selectional restrictions on the intransitive use repeated in (47) favor a detransitivization account; if the intransitive use were basic, the transitive uses in (47a) would have to be derived from an ungrammatical base.

(47)   a.   He broke his promise/the contract/the world record
        b.   *His promise/the contract/the world record broke

However, as observed by Folli (2003) and Ramchand (2008), we can also find selectional restrictions pointing in the opposite direction:

(48) a. The tent/Mary collapsed
      b. Sue collapsed the tent
      c. *Sue collapsed Mary

Furthermore, it is not clear how at the level of LSR the semantic properties of the internal argument, which combines with the verb not earlier than in the syntax, should already be known. Levin and Rappaport Hovav observe themselves that the nature of the eventuality determines whether a verb alternates or not and that, in addition, the nature of the eventuality can sometimes be determined by the verb-plus-object complex. But then the nature of the eventuality is not determined earlier than in the syntax. Such data suggest then that there is a post-syntactic level which filters out (anti-)causative event descriptions not compatible with our conceptualization of eventualities.

3.3 'COMMON BASE' APPROACHES

So far we have looked at approaches that derive one version of the alternation from another. As mentioned, these theories can in principle account for half of the morphological paradigm found cross-linguistically. Approaches assuming causativization seem to be justified by languages that mark the causative variant, approaches assuming detransitivization by languages that mark the anticausative variant. But each theory leaves half of the paradigm unexplained. One solution to this problem could be that, in principle, both processes exist across languages or even within individual languages. Such an approach was, for example, proposed in Brousseau and Ritter (1991) for French.

However, a further solution to the morphological variance has been proposed, namely, both variants of the causative alternation are derived from a common base. Languages may differ then in whether they mark none, one of the two or even both derivational processes morphologically. Such a proposal has been made in a lexicalist setting by Davis and Demirdache (2000) and Piñón (2001).
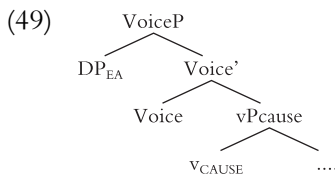
Davis and Demirdache (2000) propose to derive all change-of-state verbs from an underlying causative event representation by a process of 'event foregrounding'. They use the event structure representation of Pustejovsky (1995), where all change-of-state events are decomposed into a process (P) which brings about a change of state (T/S). In causatives, both P and T/S are foregrounded, in anticausatives only T/S is foregrounded. Only foregrounded events are syntactically realized. Furthermore, foregrounding can lead to morphological marking; this makes it possible to account, in principle, for the morphological variation found across

languages. However, in the end a bit more would have to be said about the specific reflexive or non-active morphology and its relation to foregrounding.

Syntactic approaches of the 'common base' idea can be found in Pylkkänen (2002, 2008), Embick (2004a,b) or Alexiadou et al. (2006) (see also the account in Doron 2003, which differs in that it does not assume event decomposition and involves more structured root semantics). These syntactic approaches are couched within the framework of Distributed Morphology, which claims that verbs are derived from category neutral roots by the addition of verbalizing heads (Marantz 1997). Roots are associated with non-syntactic information, so called encyclopaedic or conceptual knowledge, which can restrict the syntactic frames a root can enter. More specifically, Alexiadou et al. (2006) propose that roots are categorized along the 'external causation'/'internal causation' scheme proposed by Levin and Rappaport Hovav (1995) and that this categorization determines whether a root must occur in a transitive, causative syntax (*murder*, *assassinate*, but also *destroy*, *kill*), must occur in an intransitive, anticausative syntax (*blossom*, *wilt*) or is underspecified so that it may freely alternate between a causative or an anticausative syntax (*break*, *cool*) (see also Harley and Noyer 2000 for a categorization of roots along such lines).

Roots combine with verbalizing heads expressing events to form verbs in the syntax. However, the syntactic decomposition assumed by these theories differs from the decomposition seen thus far. Two types of differences are relevant.

On the one hand, many syntactic theories of word formation assume the proposal by Kratzer (1996) that external arguments are not introduced by the verb itself, nor by a verbal eventive head, but by a non-eventive Voice-projection on top of the (decomposed) vP.[31] Under this view, the head introducing the causative event (v_{CAUSE}) does not also introduce the external argument, rather the external argument (DP_{EA}) is introduced by Voice on top of v_{CAUSE} as in (49) (Pylkkänen 2002, 2008; Alexiadou et al. 2006).

(49)

$$
\begin{array}{c}
\text{VoiceP} \\
\diagup \quad \diagdown \\
DP_{EA} \quad \text{Voice'} \\
\diagup \quad \diagdown \\
\text{Voice} \quad \text{vPcause} \\
\diagup \quad \diagdown \\
v_{CAUSE} \quad \ldots
\end{array}
$$

Second, these theories claim that causatives and anticausatives do not differ in the number of events involved. Once again, the argument comes from the behavior of *again* in change-of-state contexts. As mentioned, this adverb can have a restitutive and a repetitive reading but an analysis that decomposes causatives syntactically into three event layers should yield three, rather than two, adverbial scopes for *again*, as illustrated below. Crucially, the reading in (50ii) is not possible (at least in languages such

as English or German) as was already observed by Von Stechow (1995, 1996).
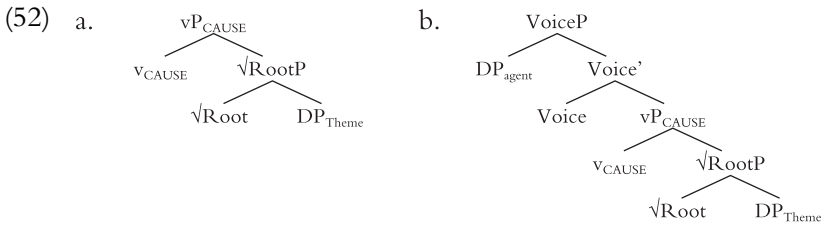
(50)   John opened the door again
    (i)   Agent's action (and the inchoative event and
        the resultant state) is repeated:
        John did something again and as a result the door opened.
        (*again* [. . . CAUSE . . . [. . . BECOME . . . [. . . STATE . . .]]])
    (ii) Inchoative event (and the resultant state) is repeated:
        John did something and as a result the door opened again.
        [. . . CAUSE . . . (*again* [. . . BECOME . . . [. . . STATE . . .]])]
    (iii) Only the resultant state is repeated:
        John did something and as a result the door returned to its
        previous state of being open.
        [. . . CAUSE . . . [. . . BECOME . . . (*again* [. . . STATE . . .])]]

A solution (already suggested by von Stechow) is that causatives and anticausatives do not differ in the number of eventive heads; lexical causatives cannot be built from three event predicates.[32] Specifically, Pylkkänen (2002, 2008) proposes that causatives and anticausatives involve the same root (expressing a resultant state over which the theme is predicated) but anticausatives (as all unaccusatives) involve a BECOME projection (51a), while causatives involve a CAUSE projection which directly combines with the root and which has a non-eventive Voice projection on top (51b).[33]

(51) a.

$$vP_{BECOME}$$
$$v_{BECOME} \quad \sqrt{Root}$$

b.

$$VoiceP$$
$$Voice \quad vP_{CAUSE}$$
$$v_{CAUSE} \quad \sqrt{Root}$$

Since both causatives and anticausatives are derived from a common root by different verbalizing heads, this proposal provides, in principle, a way to tackle the cross-linguistic morphological variation in (anti-)causatives. However, more has to be said about languages that have two morphological classes of (anti-)causatives and about the specific type of morphology typically found.

    Alexiadou et al. (2006) (following a proposal by Kratzer 2005) propose to further reduce the number of syntactic heads involved in the decomposition of (anti-)causatives. In their view, the causative alternation is basically a Voice alternation. That is, causatives and anticausatives both involve the same event decomposition and differ only in the presence vs. absence of Voice introducing an external argument. Specifically, they propose that causatives as well as non-alternating unaccusatives involve the head $v_{CAUSE.}$[34]

(52)   a.
```
                vP_CAUSE
               /        \
          v_CAUSE      √RootP
                      /       \
                  √Root      DP_Theme
```

   b.
```
                        VoiceP
                       /      \
                  DP_agent    Voice'
                             /      \
                        Voice      vP_CAUSE
                                  /        \
                             v_CAUSE      √RootP
                                         /       \
                                     √Root      DP_Theme
```

That is, the first verbalizing head combining with the RootP always introduces a causative event leading to the resultant state expressed by the root and predicated over the theme.[35] This proposal is, in a way, a syntactic counterpart to proposals made in some lexicalist theories reviewed above that anticausatives are, to some extent, inherently causative. Furthermore, Alexiadou et al. argue that even non-alternating unaccusatives (*blossom*, *welt*, . . .) have the structure in (52a); again, this is close to what some lexicalist theories proposed. Their motivation is, however, different from the one used by Levin and Rappaport Hovav (1995) or Chierchia (1989/ 2004). Instead, they build on the following observation also independently discussed by Kallulli (2006, 2007). In Section 2.1, we discussed evidence that anticausatives, in contrast to passives, do not involve an implicit external argument. One argument for this claim was that anticausatives differ from passives in that only the latter can license an external argument in a by-phrase. It turns out that although anticausatives and non-alternating unaccusatives do not license agentive by-phrases, in many languages, anticausatives and also non–alternating anticausatives expressing a change of state combine with specific PPs introducing non–human causers or causing events. This is illustrated below for English and German.

(53)   a.   The window broke from the pressure/*from Mary/*by Mary
       b.   The flowers wilted from the heat/*from Mary/*by Mary

(54)   a.   Die Tür öffnete   sich   durch   einen Windstoß/*durch
                                                    Maria/*von Maria
            The door opened   REFL   through a   blast-of-wind/through
                                                    Mary/by Mary
       b.   Die Blume verwelkte durch   die Hitze/*durch Maria/*von Maria
            The flower wilted   through the heat/through Mary/by   Mary

Crucially, these causer PPs are only possible in anticausative/unaccusative structures, suggesting that the thematic source is located in their event decomposition.[36] Alexiadou et al. argue that these PPs are thematically licensed via adjunction to v_CAUSE in (52a). Note that the authors thereby do not claim that anticausatives involve an implicit causer argument, but just that they involve a causative event (an event leading to the resultant state of the theme) and that causer PPs modify this event. Kallulli (2006,

2007) provides a different explanation for these data. She proposes that, like passives, anticausatives also involve an implicit external argument which, however, must be necessarily a causer.[37]

What can be said about the morphological variation found with the causative alternation? Causative morphology must be connected with the presence of Voice (in the context of v_{CAUSE}). Anticausative morphology could potentially be associated with v_{CAUSE} in the absence of Voice. Schäfer (2008) and Alexiadou (forthcoming) propose as an alternative that anticausative morphology is actually also connected to Voice, specifically to a semantically empty Voice projection not introducing a θ-role (see Harley 1995 and Doron 2003 for similar proposals). The background for this idea is the claim by Haspelmath (1993) discussed in Section 2.3 that if a language has marked and unmarked anticausatives, marked anticausatives tend to express events of lower spontaneity than unmarked anticausatives. Since events of low spontaneity are more likely to be brought about by an external argument than events of high spontaneity, verbs expressing events of low spontaneity could be forced to circumvent the high expectation of an external argument by projecting at least a formal, non-thematic place-holder of the external argument.[38] This idea makes some sense for non-active morphology, which is often assumed to be Voice-related. Schäfer (2008) additionally attempts to motivate the idea that reflexive clitics or reflexive pronouns are suited as a marker of expletive Voice due to their inherent non-referential status.

The above data are certainly not incompatible with lexical accounts; actually, Davis and Demirdache (2000), who see their account in the tradition of Levin and Rappaport Hovav (1995), motivate their account with very similar observations about Salish. A final piece of evidence for the inherent causative nature of anticausatives as well as non-alternating unaccusatives expressing a change of state has also been analyzed in lexical accounts (Rivero 2004; Davis and Demirdache 2000 for similar data in Salish[39]) as well as syntactic accounts (Kallulli 2006, 2007; Schäfer 2008). Many languages allow the combination of unaccusative predicates with an oblique DP (typically dative or genitive), which is interpreted as the non-volitional causer of the event expressed by the unaccusative verb. Greek examples are given below. The fact that such 'oblique' or 'nonvolitional' causers are cross-linguistically only possible in unaccusative change-of-state contexts suggests that these contexts themselves are the source of the causative semantics (Schäfer 2008).

(55) a. Tu   Ben   tu   espase   to   parathiro.
          the.GEN   Ben   he.GEN   broke.ACT   the   window.NOM
          'Ben involuntarily caused the window to break'
      b. Tu   Ben   tu   sapisan   ta   triadafila
          the.GEN   Ben   he.GEN   wilted.ACT   the   roses.NOM
          'Ben involuntarily caused the roses to wilt'

4. Conclusion

In this article, I have presented the main properties that characterize the causative alternation cross-linguistically as well as the main types of theories proposed to account for these properties. We have seen that, syntactically, anticausatives are unaccusative predicates. Semantically, verbs undergoing the causative alternation have a very stable core (non-agentive verbs of change of state), but that there are subclasses of verbs where languages differ. These differences between languages need to be researched further. Morphologically, languages vary a great deal in that some mark (a subset of) their causatives, while others mark (a subset of) their anticausatives and yet others mark both parts of the alternation. Besides accounting for this variation, the question of why we find the same morphology also in semantically quite different constructions (passive, generic middle, inherent reflexives) remains one of the main theoretical challenges. I have also illustrated the three main directions of derivation that have been proposed in lexicalist and syntactic frameworks for the causative alternation, causativization, detransitivization and derivation from a common base. Finally, I have presented some recent evidence that unaccusative change-of-state verbs are, to some extent, inherently causative; the exact implementation of these findings remains a matter of debate.

Short Bibliography

Florian Schäfer's research interests are located in syntactic theory and its interfaces with the lexicon, morphology and semantics. He received a Diploma in formal and theoretical Linguistics from Potsdam University and in 2007 a PhD in General Linguistics from the Universität Stuttgart. His dissertation focused on the causative alternation where he put forth a non-derivational approach to the phenomenon within the framework of Distributed Morphology. Since 2007, he has been working as a post-doctoral researcher at the Universität Stuttgart, on a project on the form and interpretation of nominals in the SFB 732 (Incremental Specification in Context). He has authored or co-authored papers in proceedings of NELS, WCCFL and several edited collections. A revised version of his dissertation was published 2008 under the title *The Syntax of (Anti-)Causatives. External arguments in change-of-state contexts* by John Benjamins.

Notes

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[1] For discussion of the acquisition of the causative alternation, see, for example, Pinker (1989) or Marcotte (2006).

[2] While the example in (4b) would be impossible in English, some agentive verbs of manner of motion (i) and some verbs of emission (ii) as well as verbs of spatial configuration (iii) allow a transitive use in English. Again, it is not clear whether we should subsume such pairs under the label causative alternation. Levin and Rappaport Hovav (1995) argue that pairs as in (i)–(iii) are not instances of the genuine causative alternation [see also Folli and Harley 2006 for a recent discussion of the construction in (ib)]. Note again that by far not all languages allow all of these alternations. German and French, for example, neither have transitives of the type in (4b) nor those of the type (ib) and transitives of the type (iib) are restricted to very few lexicalisations. They allow, however, the alternation in (iii).

(i)   a.   The horse jumped over the fence
      b.   The rider jumped the horse over the fence
(ii) a.   The bell buzzed/rang
      b.   The postman buzzed/rang the bell
(iii) a.   The bicycle leaned against the fence
      b.   I leaned the bicycle against the fence

[3] As a reviewer correctly remarks, these tests have been critically reviewed. Williams (1985) was the first to mention that control is problematic as a tool for detecting the syntactic presence of an implicit external argument. In his example in (i) one cannot sensibly say that the auxiliary *is* or the adjective *green* involve an implicit external argument. From this we have to conclude that purpose clauses can, sometimes, be licensed even if there is no syntactically represented antecedent for its PRO-subject available. Instead, PRO in (i) seems to refer to some purposeful controller (evolution or God) not represented in the linguistic structure. A similar phenomenon can be found in so-called 'director-contexts' as in (ii) (see Fellbaum and Zribi-Hertz 1989 on such examples).

(i)   Grass is green [PRO to promote photosynthesis]
(ii) The princess dies at the end of act III [PRO in order to shock the audience]

Similarly, Folli and Harley (2006) and Kallulli (2007) discuss unaccusative verbs that can involve agent-oriented adverbs if the theme argument is human, i.e. capable of intentionality, as in (iii).

(iii) John rolled down the hill on purpose

Nevertheless, the results in (7) and (8) are not meaningless. While the licensing of purpose clauses and agent-oriented adverbs does not necessarily indicate the presence of an implicit argument, the non-licensing of purpose clauses and agent-oriented adverbs in structures as in (7b) and (8b) can still be taken as indication that no external argument is implicitly present in anticausative structures. The point is that passives license these diagnostics freely while unaccusatives license them only under very restricted circumstances. This suggests that passives but not anticausatives involve an implicit external argument. However, one important caveat concerning the thematic role of this implicit argument will be discussed below.

[4] This holds at least for a vast majority of languages. Lekakou (2005) discusses French and Greek middles which do in fact license by-phrases. She entertains the hypothesis that the middles in these languages are 'parasitic' on passive structures thereby explaining the uncommon availability of by-phrases. Further, English middles sometimes license 'for-phrases' (These books read easily for little children). Stroik (1992) argues that these for-phrases denote the implicit external argument in middles, similar to by-phrases in English passives. See Ackema and Schoorlemmer (2005) and the references there for a critical discussion of the claim that for-phrases in English middles express an implicit external argument.

[5] See also Härtl (2003) for discussion of further tests that suggest this conclusion.

[6] The syntactic status of the subject of middles as a basically internal or external argument is still controversial (cf. Ackema and Schoorlemmer 2005 for an overview and references).

[7] For recent psycholinguistic evidence, see Friedmann et al. (2008).

[8] As is often the case within the domain of unaccusativity, certain mismatches occur. As is discussed below, many languages have two morphological classes of anticausatives, marked and unmarked anticausatives. Labelle (1990, 1992) argues that French anticausatives marked with the reflexive clitic '*se*' are unaccusative while unmarked anticausatives are unergative. For example, unmarked anticausatives select '*avoir*' (have) although non-alternating unaccusatives and marked anticausatives select '*être*' (be). German also has a split between unmarked anticausatives and anticausatives marked with the reflexive pronoun '*sich*'. Here the situation is different. Unmarked anticausatives select '*sein*' (be) while marked anticausatives select '*haben*' (have). However, both types of anticausatives qualify as unaccusatives with respect to a number of further tests in German. The fact that marked anticausatives select '*haben*' seems to be a complexity triggered by the specific type of reflexive pronoun involved which acts as an expletive subject without theta role; in both types of anticausatives the theme is an underlying object (see Schäfer 2008).

[9] Recall from the introduction that some languages allow transitive versions of unergative verbs; as stated there, the theoretical status of this phenomena (as an instance of the lexical causative alternation or not) is unsettled.

[10] The English facts are actually more complicated than described in the text. As McKoon and Macfarland (2000) and Wright (2002) show, many unaccusatives presumed by Levin and Rappaport Hovav (1995) to lack causative variants can in fact be found in corpora in a causative use; crucially, however, their subjects are never human agents but always non-agentive causers.

[11] For a recent overview, see Levin and Rappaport Hovav (2005, forthcoming).

[12] See Reinhart (2000, 2002) and Doron (2003) for some critzism of accounts to the causative alternation building on event decomposition. These authors each provide different alternative systems of lexical decomposition.

[13] A formal definition of these predicates can be found in Dowty (1979).

[14] Alternatively, the causer argument is not introduced by CAUSE but by a further argument DO which is itself the second argument of CAUSE as in (i). This difference will become relevant later.

(i)   [[x DO] CAUSE [BECOME [y <STATE>]]].

[15] As a reviewer notes, non-agentive motion verbs undergoing the causative alternation (cf. 16b) must have a somewhat different event decomposition as they are activities, not accomplishments or achievements. They probably involve a (non-agentive) ACTIVITY/PROCESS-predicate instead of a BECOME-predicate. Further, the lexical roots of these verbs do not express states. These roots could enter the decompositional structure as modifiers of the ACTIVITY/PROCESS-predicate (see Levin and Rappaport Hovav (2005:72) and Embick (2004b) for some discussion of roots acting as modifiers).

[16] Recall that many change-of-state verbs are deadjectival.

[17] Some English speakers accept '*cut*' with causer subjects as in (23b). This verb is then an example where manner information (sharp object involved) prohibits anticausative formation but not causer subjects.

[18] Causer subjects become acceptable as soon as a path or goal PP is added (i). At least some English speakers have similar judgements.

(i)   Der Wind rollte den Ball *(über die Torlinie)
       The wind rolled the ball across the goal line

[19] Sometimes one finds pairs of different roots which seem to form a causative-anticausative pair as in English *kill* vs. *die*. This phenomenon is called *suppletive* formation by Haspelmath.

[20] Typically, these two types of anticausatives do not differ in their status as unaccusatives; though see footnote 8 for some refinements.

[21] In addition, some of these languages have a small number of verbs that can optionally occur in both paradigms (see the literature cited below). This class is especially illustrative for the

question discussed below whether semantic effects are associated with the presence vs. absence of morphological marking.

[22] Haspelmath (2008) proposes to reinterpret his account building on iconicity in terms of frequency of use.

[23] For the broader picture involving obligatorily marked and obligatorily unmarked anticausatives, see Folli (2003). Schäfer (2008) casts some doubts on the generality of the effects reported by Folli.

[24] Schäfer (2008) discusses a semantic difference between marked and unmarked anticausatives in German which is not related to aspectual notions. German marked and unmarked anticausatives differ in the way a so called free (non-subcategorized) dative can be interpreted in their context.

[25] On the empirical side, this shared morphology sometimes makes it hard to categorize constructions. For example, in Greek some anticausatives are marked with non-active morphology and this very same morphology is also used to form passives (as well as generic middles and inherently reflexive verbs). This often makes it hard to tease apart passives from anticausatives in this language [a similar situation holds in Albanian (Kallulli (2007)]. Alexiadou et al. (2006) claim that there are systematic differences that allow one to distinguish anticausatives from passives in Greek (e.g. the 'by-itself'-test discussed below gives positive results only in anticausatives but not in passives). Kallulli (2007) argues against the claim that passives and anticausatives formed by the same morphological device can be kept apart and therefore offers a somewhat different view on the passive-anticausative syncretism in languages such as Greek and Albanian.

[26] Detransitivization is hardly possible in syntactic theories of verb formation as there are no syntactic processes that eliminate structure (but see Kallulli 2006 who proposes not to delete syntactic structure itself but interpretive features on syntactic heads). However, a similar restriction holds for lexicalist accounts under the so called *Monotonicity Hypothesis* recently defended in Koontz-Garboden (2007) which states that word formation operations can add decompositional operators to a word's lexical semantic representation but they cannot remove them.

[27] Doron (2003) mentions in this connection that Hebrew has an anticausative version of 'give birth' and points out that a reflexive interpretation is hardly conceivable (X gave birth to Xself).

[28] Or denies that the event must have a causer, as in (i).

(i)   You don't have to go and see a doctor. This wound will heal by itself.

[29] With passives as in (i), 'by itself' is out as the presence of the implicit argument in passives contradicts the entailment carried by 'by itself' that no external argument (causer) can be identified.

(i)   The door was suddenly opened (*by itself)

The licensing of 'by-itself' is then a further test to differentiate between passives and anticausatives; it suggests that the former have an implicit external argument while the latter have not (cf. Section 2.1). See also the discussion in Section 3.3. Note that 'by-itself' is bad in passives even if the implicit argument is a non-intentional agent or a non-human causer. This test is, therefore, not subject to the same criticism as other tests intended to detect the presence of an implicit external argument such as control into purpose clauses and agentive adverbs (cf. Section 2.1).

[30] In passives, the external argument is existentially bound at the level of AS and is, therefore, semantically active.

[31] Note that in, for example, Chomsky (1995) vP is the layer that introduces the external argument, while in Kratzer's work it is Voice that has this function. Importantly, in the theories discussed in this section, little v just verbalizes a structure without introducing an external argument. External arguments are introduced by Voice on top of little v via a process called event identification (Kratzer (1996)).

[32] A different argument that lexical causatives syntactically decompose into one but not two verbal layers (in addition to the resultant state) can be found in Harley (2008).

[33] I ignore here the proposal by Pylkkänen (2002, 2008) that Voice and vCAUSE can be either independent projections or can be bundled into one head (but see the next footnote).

[34] This proposal makes it necessary to reanalyse certain constructions that Pylkkänen (2002, 2008) analyzes as 'causatives without a causer argument'. See Schäfer (2008) for a proposal.

[35] As an alternative, Alexiadou et al. (2006) and Schäfer (2008) suggest that the first verbal head is not semantically tagged as causative, but that the causative semantics result at LF from the local combination of a v-head just expressing an unbounded event (the same head used in activities) and a resultant state. This makes their theory close in spirit to the theories of syntactic decomposition proposed by Hale and Keyser (2002) or Marantz (2005).

[36] The alternative is that the prepositions themselves introduce the causative semantics and it has to be investigated independently for each individual language; this alternative is refuted in Alexiadou and Anagnostopoulou (forthcoming) for Greek and in Schäfer (2008) for German. However, Levin (forthcoming) provides English examples of unergative verbs with causative 'from-PPs'; these data suggest that the source of the causative semantics of these PPs is not (necessarily) located in the event semantics of the modified predicates.

[37] It seems to me that the fact that anticausatives but not passives license 'by itself' in English (see footnote 29) and the counterparts of 'by itself' in other languages (see Alexiadou et al. 2006) is problematic for the claim that anticausatives involve an implicit external causer argument. Furthermore, external arguments (agents) and PPs modifying the causative event can, in principle, co-occur in the languages discussed in Alexiadou et al. (2006) suggesting again that the latter do not have the status of an (implicit) external argument.

[38] The observation that Greek anticausatives derived from adjectives remain morphologically unmarked (Alexiadou and Anagnostopoulou 2004) supports this suggestion, as adjectival cores/roots do not introduce implications concerning the presence of an external argument, which, in turn, could trigger non-active morphology [cf. the discussion in Section 2.2 below example (27)].

[39] Note that the corresponding Salish construction is possible with verbs of appearance. This is not the case in the languages studied by Rivero (2004), Kallulli (2006) and Schäfer (2008).

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