The properties of anticausatives crosslinguistically[1]

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1. Goals

The causative/anticausative alternation has been the topic of much typological and theoretical discussion in the linguistic literature. This alternation is characterized by verbs with transitive and intransitive uses, such that the transitive use of a verb V means roughly 'cause to V-intransitive' (see Levin 1993). The discussion revolves around two issues: the first one concerns the similarities and differences between the anticausative and the passive, and the second one concerns the derivational relationship, if any, between the transitive and intransitive variant. With respect to the second issue, a number of approaches have been developed. Judging the approach conceptually unsatisfactory, according to which each variant is assigned an independent lexical entry, it was concluded that the two variants have to be derivationally related. The question then is which one of the two is basic and where this derivation takes place in the grammar.

Our contribution to this discussion is to argue against derivational approaches to the causative/anticausative alternation. We focus on the distribution of PPs related to external arguments (agent, causer, instrument, causing event) in passives and anticausatives of English, German and Greek and the set of verbs undergoing the causative/anticausative alternation in these languages. We argue that the crosslinguistic differences in these two domains provide evidence against both causativization and detransitivization analyses of the causative/anticausative alternation. We offer an approach to this alternation which builds on a syntactic decomposition of change of state verbs into a Voice and a CAUS

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component. Crosslinguistic variation in passives and anticausatives depends on properties of Voice and its combinations with CAUS and various types of roots.

2. Distinguishing between passives and anticausatives

Passives and anticausatives in English differ in two well-known aspects (Manzini 1983; Marantz 1984; Jaeggli 1986; Roeper 1987; Baker, Johnson and Roberts 1989; Levin and Rappaport Hovav 1995; Reinhart 2000; Chierchia 1989/2004, among many others):

(i) *Modification / Control*: Passives but not anticausatives can be modified by *by*-phrases, agent-oriented adverbs, and allow control into purpose clauses, as illustrated in the examples (1-3):

(1) a. *The boat was sunk by Bill*
     b. **The boat sank by Bill*
(2) a. *The boat was sunk on purpose*
     b. **The boat sank on purpose*
(3) a. *The boat was sunk to collect the insurance*
     b. **The boat sank to collect the insurance*

(ii) *Verb Restrictions*: Virtually any transitive verb can be passivized, but only a subset of transitive verbs form anticausatives:

(4) a. *The baker cut the bread*
     b. *The bread was cut by the baker*
     c. **The bread cut*
(5) a. *Bill broke the glass*
     b. *The glass was broken by Bill*
     c. *The glass broke*

2.1 Previous explanations

As far as the first difference is concerned (modification and control), the consensus has been reached that this is due to the presence vs. absence of an implicit external argument in passives and anticausatives respectively. While passives contain such an implicit external argument which can be accessed by modification (by-phrases, agent-oriented adverbs) and can control into purpose clauses, anticausatives lack such an argument and therefore modification and control are impossible (see 1-3). Two issues of controversy remain, though: the level at which the implicit external
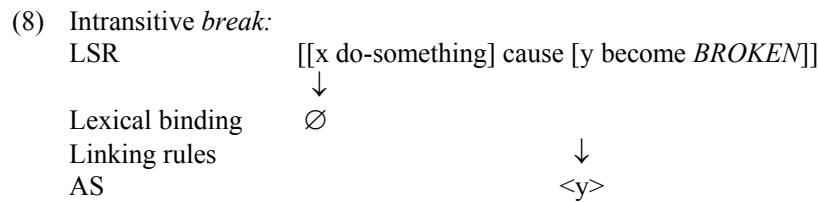
argument is expressed in the passive[2] and why anticausatives lack an implicit external argument.

To answer the latter question, two influental views have been proposed. According to one view, anticausatives lack an implicit external argument because they are *basically monadic*. The causative alternant is derived from the anticausative/inchoative via *causativization* (Lakoff 1968, 1970; Dowty 1979; Williams 1981; Brousseau and Ritter 1991; Pesetsky 1995 among others). This is illustrated in (6) below taken from Dowty (1979, section 4.3):

(6) a. *break*$_{\text{incho}}$: λx [Become *BROKEN* (x)]
     b. *break*$_{\text{caus}}$: $\lambda y \lambda x$ [$\exists$P [P (x) Cause Become *BROKEN* (y)]]

According to the second view, alternating verbs are *inherently dyadic* predicates. Anticausatives lack an implicit external argument due to a lexical process of *detransitivization* that creates an intransitive entry from the transitive one. There are two recent implementations of this general idea, which we briefly summarize below:

(i) Levin and Rappaport Hovav (1995: 83, 108; henceforth L&R-H) propose a bi-eventive analysis of causative verbs. Their lexical semantic representation (LSR) of such verbs involves the predicate 'cause' which takes two arguments: the *causing* subevent and the *central* subevent (the latter specifying the change associated with the verb). The *cause* argument is associated with the causing subevent and the *theme* is associated with the central subevent. In transitive *break* the cause and the theme are projected from the LSR into argument structure (AS) (and from AS onto the syntax) as shown in (7):

(7) Transitive *break:*
     LSR   [[x do-something] cause [y become *BROKEN*]]
     Linking rules   ↓   ↓
     AS   x   <y>

In intransitive *break* the cause is lexically bound in the mapping from LSR to AS thereby being prevented from being projected into the syntax (cf. 8):

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[2] Some assume that the implicit argument is present in the lexical syntactic representation of the verb, i.e. its argument structure (e.g. L&R-H 1995), some that it is present in the semantic representation of verbs (e.g. Reinhart 2002) and others that the implicit argument is even realized in the syntax (e.g. Baker, Johnson, and Roberts 1989; Kratzer 1994).

(8) Intransitive *break:*
     LSR   [[x do-something] cause [y become *BROKEN*]]
                                   ↓
     Lexical binding   ∅
     Linking rules   ↓
     AS   <y>

(ii) Reinhart (2000, 2002), building on Chierchia (1989/2004), proposes that causation is coded through a lexical cause [+c] feature defining a set of theta-roles that cause change, namely *cause, agent, instrument*.[3] Alternating verbs are inherently transitive. They select a [+c] external argument (and a [-c-m] *theme* internal argument). Anticausatives are derived from the transitive entry in the lexicon by a reduction operation (called "expletivization" and shown in (9)) that reduces the external [+c] role. The output of expletivization is a one place (intransitive) verb entry:

(9) Expletivization: Reduction of an external [+c] role
     a. V_{acc} $(\theta_{1[+c]},\theta_2) \rightarrow R_e$ (V) (θ_2)
     b. R_e (V) (θ_2) = V (θ_2)

2.2 Problems for previous analyses[4]
2.2.1 Morphological marking
While the causative alternation is a semantically quite well-defined crosslinguistic phenomenon, languages show substantial variation in the morphological shape of the alternation (Haspelmath 1993) to which neither of the derivational accounts can do full justice. Any derivational approach that derives one version of the causative/anticausative alternation from the other states that the derived version is more complex, since it is formed by an extra operation on some computational level of grammar. But the morphological variation found with the alternation does not support any direction of derivation in a compelling way; both views discussed above are challenged by languages with *special morphological marking* on what is assumed to be the basic version of the alternation, i.e. they are challenged

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[3] In Reinhart's (2002) theta-system, *agent* is positively specified for the feature *m (mental state)*, i.e. *agent* is [+c+m]. *Instrument* is [+c-m]. Its presence implicates the existence of an agent due to a lexical generalization. *Cause* is characterized as [+c], which makes it consistent with the [+c+m] and the [+c-m] construal (capturing the generalization that verbs selecting for *cause* arguments also select *instruments* or *agents*).

[4] Some of the following arguments have already been brought up in Doron (2003).

by a mismatch of assumed derivational and overt morphological complexity. The causativization view faces the problem that it leaves unexplained the fact that in many languages the anticausative and not the causative variant of the alternation is marked by *special morphology* ((10), see also Haspelmath 1993; Chierchia 1989/2004; L&R-H 1995; Reinhart 2000; 2002; Piñon 2001b).

(10) <u>Anticausative Marking</u>:
  a. Russian: *katat'-sja* 'roll (intr)' (Haspelmath 1993:91)
       katat' 'roll (tr)'
  b. Polish: *złamać-się* 'break (intr)' (Piñon 2001b:2)
       złamać 'break (tr)'

On the other hand, as Piñon (2001b) points out, the postulation of a detransitivization process faces a similar problem with languages that mark the *causative* variant of the alternation (11). Furthermore, there are also languages with *non-directed* alternations which do not fit easily any of the above views: *equipollent* when both forms are derived from a common stem (12a), *suppletive* when different roots are used (12b), *labile* when the same form is used (12c).

(11) <u>Causative Marking</u>:
  a. Georgian: *duɣ-s* 'cook (intr) (Haspelmath, op.cit.)
          a-duɣ-ebs 'cook (tr)'
  b. Khalka Mongolian: *ongoj-x* 'open (intr)' (Piñon, op.cit)
          ongoj-lg-ox 'open (tr)'

(12) <u>Non-directed Alternations</u>:
  a. Japanese: *atum-aru* 'gather (intr)' (Haspelmath, op.cit.)
       atum-eru 'gather (tr)'
  b. Russian: *goret'* 'burn (intr)'
       žeč   'burn (tr)'
  c. English: *open* 'intr'
       open 'tr'

2.2.2 Verb restrictions and selection restrictions

Both accounts face the same logical problem that sometimes they have to derive change of state verbs from a corresponding non-existent base.

  The causativization view faces this problem with the derivation of causatives from non-existing anticausatives; this is the case in the context of the *verb restrictions* discussed above, i.e. the difference between "break"

and "cut": the former can form an anticausative but the latter lacks an anticausative.

The same problem also emerges with change of state verbs that show *selection restrictions*. More specifically, some verbs have intransitive uses only for certain choices of internal arguments, as is illustrated below with examples taken from L&R-H (1995, 85-86). Causatives impose no such selection restrictions.

(13) a. *He broke his promise / the contract / the world record*
     b. **His promise / the contract / the world record broke*
     c. *He broke the vase*
     d. *The vase broke*

L&R-H (1995: 105-106) argue that *verb restrictions* and *selection restrictions* are related and both can be handled by the detransitivization view on the basis of the following generalization (Smith 1970; L&R-H 1995; see also Reinhart 2000, 2002)**:**

(14)   The transitive verbs that cannot form anticausatives restrict their subjects to *agents* or *agents* and *instruments* and disallow *causers*.

As shown in (15)–(16), the non-alternating "cut" selects an agent or an instrument as a subject but disallows a causer, while the alternating "break" is compatible with an agent, an instrument and a causer subject, in accordance with generalization (14).

(15) a. *The baker / the knife cut the bread*
     b. **The lightning cut the clothesline*
     c. **The bread cut*
(16) a. *The vandals / the rocks / the storm broke the window*
     b. *The window broke*

The same explanation can also account for the selection restrictions in (4) above because for certain choices of objects the nature of the external argument is specified. The eventuality cannot come about without the intervention of an *agent* in (15b).

The rationale behind (14) in the detransitivization view is that a causative verb can leave its external argument unexpressed, if its thematic nature is left underspecified (agent *or* causer *or* instrument). If the verb lexically specifies something about the nature of the external argument,

then the external argument position cannot be "lexically bound" or "reduced".

But the detransitivization view also encounters the logical problem that sometimes it would have to derive something from a non-existing base. This is the case with change of state unaccusatives which have no causative counterpart (e.g., bloom, blossom, decay, flower). The examples in (17) are taken from L&R-H 1995: 97.

(17) a. *The cactus blossomed early*
     b. **The gardener blossomed the cactus*
     c. **The warm weather blossomed the cactus*

The crucial property of these verbs is that they describe changes of state that are *internally caused*, i.e. the cause of the change of state event is linked to properties inherent to the argument undergoing change. In contrast, verbs that have a causative counterpart can be *externally caused,* i.e. can be brought about by an external cause (cf. L&R-H 1995).

In the next sections, we discuss two further problems for a detransitivization approach towards anticausatives. The first one (discussed in section 3) concerns the types of arguments that can be introduced by PPs in anticausatives. The second one (discussed in section 4) has to do with crosslinguistic differences in verbs licensing the alternations and selectional restrictions. Our factual discussion will concentrate on data from English, German and Greek.

3. PP Modification in passives and anticausatives crosslinguistically
3.1 English

As already mentioned in section 2.2.1, English causatives license all types of external arguments, namely agents, causers (18), causing events (19a) and instruments (20a). Note that causing events and instruments can also be introduced as PPs, coocurring with agent subjects (19b/20b).

(18)   *John / The earthquake broke the vase*
(19) a. *Will's banging shattered the window*
     b. *I cooled the soup by lowering the temperature*
(20) a. *A stone broke the window*
     b. *I broke the window with a stone*

In the English passive, PPs bearing all of the above thematic roles are licit.

(21)   *The window was broken by John / by the storm / with a stone*

(22)   *The window was shattered by Will's banging*

Turning to English anticausatives, notice first that they license the phrase *by itself* in the interpretation "without outside help":

(23)   *The plate broke by itself*

Chierchia (1989/2004) and L&R-H 1995 argue that this modifier reflects the presence of a cause component in the LSR of anticausatives, providing evidence for the detransitivization analysis.

Anticausatives do not license agents, instruments and causers/causing events introduced by the preposition *by*, as shown in (24) and (25):

(24)   **The window broke by John / with a stone*
(25) a. **The window broke by the storm*
     b. **The window shattered by Will's banging*

However, they do license causers and causing events if these are introduced by the preposition *from,* as has been discussed in the literature (DeLancey 1984, Piñon 2001a, Levin & Rappaport 2005, Kallulli 2005).

(26)   *The window cracked / broke from the pressure*[5]
(27)   *The window cracked / broke from the explosion*
(28)   **The door opened from Mary / from the key*

The distribution of PPs in English passives is correctly predicted by the ditransitivization approach. As mentioned in section 2.1, passives (of causatives) contain a thematically unspecified implicit external argument (resulting from saturation in Reinhart's system, or it is present in A-structure and is bound from the mapping from A-structure into syntax in L&R-H's terms). This implicit external argument can be modified by PPs denoting agents, instruments, causers/causing events, i.e. the three theta-roles that are also licensed in the corresponding causatives.

Anticausatives, on the other hand, are taken not to contain a thematically unspecified implicit external argument. Therefore, PPs denoting agents, instruments, causers / causing events, i.e. the three theta-

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[5] The causing event can sometimes/for some speakers be introduced by 'through' instead of 'from':
(i)   a. *John's smoking ((of) cheap cigars) worsened the air quality in the room.*
       b. *?The air quality worsened through John's smoking.*

roles that are licensed in the corresponding causatives, are expected not to be licensed. This prediction seems to be borne out if one concentrates on the *by*-phrases in (24) and (25), but not if one takes into consideration the well-formedness of the causer *from*-phrases in (26-8). On the detransitivization view, these examples are expected to be ungrammatical, contrary to fact. In the next two sections we will show that the same problem arises in German and Greek.

3.2 German
Before we proceed to the discussion of the argument realisation in German causatives, passives and anticausatives, a note on the prepositions associated with the different thematic roles under discussion is in order. In German agents are introduced by *von* (32), instruments by *mit* (31b, 32) causers/natural forces by *durch* (32),[6] and causing events by *durch* (30b, 33).

As in English, causatives license all of the above external arguments (29, 30a, 31a), and agent-subjects can co-occur with causing-event/ instrument PPs in causatives (30b, 31b).

(29)   *Hans /   der Erdstoß   zerbrach   die Vase*
            'Hans /   the earth-tremor   broke   the vase'

(30) a.   *Das Rauchen   von Zigaretten verschlechtert   die Luftqualität*
           The smoking   of cigarettes   worsens   the air-quality
           im   Raum.
           in-the room
           'Smoking cigarettes worsens the air quality in the room'

       b.   *Peter verschlechtert die Luftqualität   im   Raum*
           Peter worsens   the air-quality   in-the room
           durch   das Rauchen   von Zigaretten.
           through   the smoking   of cigarettes
           'Peter worsens the air quality in the room by smoking cigarettes'

(31) a.   *Die Medizin   heilt   den Patienten*
           The medicine   cures the patient

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[6] Many German speakers allow both *von* and *durch* to introduce natural forces.

b. *Der Arzt   heilt   den Patienten mit   der Medizin*[7]
The doctor   cures the patient   with the medicine

German passives behave similarly to their English counterparts**.** They permit agents, causers/forces, instruments (32) and causing events (33):

(32)   *Die Vase wurde von Peter/ durch den Erdstoß   / mit dem*
The vase was   by Peter / through-the earth tremor / with the
Hammer   zerbrochen
hammer   broken
'The vase was broken by Peter / by the earth tremor / with the Hammer'

(33)   *Die Luftqualität   im   Raum wird   durch   das Rauchen*
The air-quality   in-the room is   through   the smoking
von Zigaretten verschlechtert
of cigarettes   worsened
'The air quality in the room is worsened by the smoking of cigarettes'

German anticausatives do not license agents and instruments (34) but license causers and causing events if these are introduced by *durch* (35-36). Thus they behave exactly like their English counterparts. Note that there are two morphologically distinct types of anticausatives in German (± reflexive morphology; compare e.g. (34a) to (34b) below). These morphological differences do not influence the distribution of the PPs.

(34) a. *Die Vase zerbrach   *von Peter / *mit dem Hammer*
The vase broke   *by Peter /   *with the hammer
    b. *Die Tür   öffnete   sich   *von Peter /   *mit dem Schlüssel*
The door opened   REFL   by Peter /   with the key

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[7] German does not allow instruments in subject position but only 'instrument-causers' ("Instruments which can be conceived as acting on their own, once the agent has applied or introduced them", cf. Kamp and Rossdeutscher 1994: 144):
(i)   a. *Der Arzt   heilt den Patienten mit   der Kamille /   dem Skalpell*
The doctor cures the patient   with the camomile /   the scalpel
    b. *Die Kamille /   *Das Skalpell   heilt   den Patienten*
The camomile / *the scalpel   cured the patient
In the example (ii) below "the hammer" is ungrammatical unless it is contextually construed as an instrument-causer:
(ii)   (?*)*Der Hammer zerbrach die Vase*
The hammer broke the vase

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(35) a. *Die Vase zerbrach   durch   ein Erdbeben*
　　　 The vase broke   through   an earthquake
　　b. *Die Tür   öffnete sich   durch   einen Windstoß*
　　　 The door opened REFL through   a   blast-of-wind
(36) 　 *Die Luftqualität   im Raum   verschlechtert sich*
　　　 The air-quality   in-the room   worsens   REFL
　　　 durch   das Rauchen   von Zigaretten massiv.
　　　 through   the smoking   of cigarettes   severely

Finally, the German counterpart of the English *by-itself* phrase is licensed in anticausatives.

(37) a. *Die Vase zerbrach   von selbst*
　　　 'The vase broke   by itself'
　　b. *Die Tür   öffnete   sich   von selbst*
　　　 'The door opened   REFL   by itself'

3.3 Greek

Again, before we proceed to the discussion of the Greek data, we need to introduce the PPs associated with the thematic roles under discussion. In Greek, agents are introduced by *apo* (38a), instruments by *me* (38a), causers/natural forces are introduced by either *apo* or *me* (41)[8] and causing events are introduced by *me* (42).

　　　Since Greek causatives behave similarly to their English and German counterparts, we do not present the relevant data here. Turning to the Greek passive, let us first note that unlike English and German the Greek passive is synthetic and is characterized by the presence of *non-active* morphology. As the following data show, the Greek passive licenses agents and instruments (38a) but not causers (38b) and causing events

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[8] Choice of *apo* vs. *me* seems to correlate with "direct" vs. "indirect" causation (Bittner 1999; Kratzer 2003). In contexts where the causal relation between the causer and the change of state is semantically indirect (the causal chain includes intermediate causes) *me* is favored and *apo* is dispreferred (in examples (a, b) below *apo* is licensed only in a temporal interpretation corresponding to *since*):
(i)　a.　I times afksithikan me tin krisi tu petreleu / ??apo tin krisi tu petreleu
　　　　The prises increased with the petrol crisis / by the petrol crisis
　　b.　 I dimosia sinkinonia alakse me tus Olimbiakus agones / ??apo tus Olimbiakus agones
　　　　Public transportation changed with the Olympic games / by the Olympic games

(38c), and therefore it crucially differs from the English and German passsive (see also Zombolou 2004).

(38) a. *Ta   mallia mu stegnothikan   apo tin komotria /*
         The hair my   dried-**Nact**   by the hairdresser /
         me   to   pistolaki
         with the hair-dryer
         'My hair was dried by the hairdresser / with the hair dryer'
    b. ?**Ta ruxa   stegnothikan   apo ton ilio / me ton ilio*
         The clothes   dried-**Nact**   by the sun / with the sun
         'The clothes were dried by the sun'
    c. ?**Ta ruxa   stegnothikan   me toaploma   ston ilio*
         The clothes   dried-**Nact**   with the hanging-up under the sun
         'The clothes were dried by hanging them up under the sun'

Greek anticausatives are like their English and German counterparts in that they do not license agents (39) but do license causers and causing events (41-42; see also Zombolou 2004). Unlike English and German, Greek anticausatives license instruments (40; but see fn. 7 and 8 and section 5 for refinements). As in German, there are two morphologically distinct types of anticausatives in Greek (± active morphology) and this difference does not influence the distribution of the PPs (compare 39a to 39b, 40a to 40b, 41a to 41b and 42a to 42b). However, an issue arises concerning the verbs that form both the passive and the anticausative via non-active morphology e.g. *katastrefo* 'destroy' (in 39b) or *skizo* 'tear' (in 40b); these are ambiguous between the two interpretations.[9] For those verbs, modification by an agent PP yields a passive interpretation (see 39b).

(39) a. **Ta mallia mu stegnosan   apo tin komotria*
         The hair my dried-**Act**   by   the hairdresser
         '*My hair dried by the hairdresser.'
    b. (*) *To hirografo   katastrafike   apo tin ipalilo*
         The manuscript   destroyed-**Nact**   by   the employee
         '*The manuscript destroyed by the employee.'

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[9] Note that *katastrefo* 'destroy' forms anticausatives in Greek, unlike English and German. See section 4 for extensive discussion.

(40) a. *Ta mallia mu stegnosan me to pistolaki*[10]
         The hair my dried-**Act** with the hair-dryer
         '*My hair dried with the hair dryer.'

   b. *To pani skistike me to psalidi*
       The cloth tore-**Nact** with the scissors
       '*The clothes tore with the scissors.'

(41) a. *Ta ruxa   stegnosan apo / me   ton ilio*
         The clothes   dried-**Act** by / with   the sun
         '*The clothes dried by the sun'

   b. *To hirografo   katastrafike   apo / me tin pirkagia*
       The manuscript   destroyed-**Nact**   by / with the fire
       'The manuscript got destroyed by the fire'

(42) a. *Ta ruxa   stegnosan me to aploma   ston ilio*[11]
         The clothes   dried-**Act** with the hanging-up under the sun
         '*The clothes dried by hanging them up under the sun'

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[10] Not all anticausatives allow instruments, as shown in (i-ii):
(i) **O tixos asprise   me   to   pinelo*
     The wall whitened   with the   paint-brush
(ii) **To psigio   ksepagose me   to maxeri*
     The refrigerator defroze   with a knife
It seems that instruments are licensed when they can surface as subjects in the corresponding transitives (compare the well-formed transitive (iiia) to its well-formed counterpart (40a) and the ill-formed (iiib) to (i)) and they are not licensed when they cannot be subjects of transitives:
(iii) a. *To pistolaki   stegnose   ta mallia*
        The hair-dryer dried   the hair
    b. **To pinelo   asprise   ton tixo*
        The paint-brush   whitened   the wall
The above seems to relate to the distinction between instruments and instrument-causers in German; see fn. 7.
[11] It seems that sometimes *apo* can introduce a causing event when this is understood as a "direct causer", as in (ia). This is possible only when the causing event is expressed though a process nominal, not when it is expressed through a nominalized clause; see (ib):
(i) a. *I porta espase apo to apotomo klisimo*
         The door broke by the abrupt closing
    b. *Me/*apo to na kliso apotoma tin porta tin espasa*
        With/ *by the SUBJ close-1sg abruptly the door Cl-acc broke-1sg
        'I broke the door by closing it abruptly'
The contrast between (ia) and (ib) as well as the contrast between (ia) and the examples in (42) are left to further research.

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b. *Me   tin afksisi tis igrasias   to hirografo   katastrafike*
   With the   rising the humidity-gen the manuscript destroyed-**Nact**
   '*The manuscript destroyed by the rising of humidity'

Finally, as in the other two languages, the *by-itself* phrase is also licensed in Greek anticausatives.

(43) a. *I porta   anikse   apo moni tis*
       The door opened-**Act**   by alone-sg hers
       'The door opened by itself'
   b. *To pani   skistike   apo mono tu*
       The cloth tore-**Nact** by alone-sg its
       'The cloth tore by itself'

Summarizing, assuming that the grammaticality of *from*-PPs, *durch*-PPs and *apo/me*-PPs points to the presence of an *implicit causer* in anticausatives, then the difference between passives and anticausatives in English, German and Greek cannot be expressed in terms of the presence (in passives) vs. absence (in anticausatives) of implicit arguments. Moreover, the fact that agents are licensed exclusively in passives and not in anticausatives suggests that the difference between the two constructions has to do with the presence of agentivity only in the former. Furthermore, the observation that the passive in Greek can only be modified by an agent or an instrument (and not a causer/causing event) leads to the conclusion that the implicit argument in Greek passives is an agent and never an unspecified external argument.

4. Crosslinguistic differences in verb and selection restrictions
The core of verbs that undergo the causative alternation is stable across languages. There is, however, interesting variation in two domains, namely verb restrictions and selection restrictions.
    With respect to the first domain, there are verbs that are predicted by L&R-H and Reinhart to allow the alternation but don't in English (and German), while they do in Greek, e.g. *destroy* and *kill*: [12]

(44) a. *John / the fire / the bomb destroyed the manuscript*
   a'. **The manuscript destroyed*
   b. *John / the fire / the bomb killed Mary*

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[12] As pointed out by Reinhart (2002), 'destroy' has an unaccusative variant in Hebrew (*neheras*) and French (*se-detruire*).

b'.   *Mary killed
(45) a.   *O Petros /i fotia /   i vomva   katestrepse   to paketo*
           Peter /   the fire /   the bomb destroyed   the package
     b.   *To paketo   katastrafike   apo / me tin fotia / me tin vomva*
           The package   destroyed-**Nact** by / with the fire / with the bomb
(46) a.   *O Petros / o sismos /   i vomva   skotose   ti Maria*
           Peter /   the earthquake / the bomb   killed   Mary
     b.   *I Maria   skotothike   apo/me ton sismo /   me tin vomva*
           Mary   killed-**Nact**   by/with the earthquake / with the bomb

        With respect to the second domain, certain V+Obj combinations predicted by L&R-H and Reinhart to not allow the alternation do in Greek. The Greek vs. English/German contrast is illustrated in (47)–(49).

(47) a.   *He broke his promise / the contract/ the world record.*
     b.   **His promise / the contract / the world record broke*
     c.   *The dressmaker lengthened the skirt / *The skirt lengthened*
(48) a.   *Er   brach sein   Versprechen / den   Weltrekord*
           He   broke his   promise /   the   world-record
     b.   **Sein Versprechen / der Weltrekord   brach*
           His promise /   the world-record   broke
(49) a.   *O athlitis   espase to simvolaio / to pagkosmio record*
           The athlete   broke the contract / the world   record
     b.   *To simvolaio / to pagkosmio   record   espase*
           The contract / the world   record   broke-**Act**

Recall that contrasts like the ones in (47) and (48) have been taken to show that when the subject is necessarily an agent anticausativization of verbs normally entering the alternation is impossible (see L&R-H 1995: 85–88; 105). But this does not explain why the Greek examples are grammatical.

5. Towards an account[13]
As argued for in the previous sections, derivational analyses of the causative alternation have several drawbacks. First, the crosslinguistic variation in morphological marking found in the alternation does not provide conclusive evidence for either direction. Second, both views do not fare satisfactorily with respect to the issue of verb/selection restrictions within a language and across languages. As pointed out in section 2, the

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[13] Special thanks to Hagit Borer, Edit Doron, Hans Kamp, Gillian Ramchand and Peter Svenonius for their insightful comments on earlier versions of this part.

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causativization approach has nothing to say on this issue. Moreover, we showed in section 4 that the class of alternating verbs is not stable across languages. The verbs that alternate in English and German form a subset of the verbs alternating in Greek, a variation not expected by the detransitivization approach. Even more importantly, the thematic restriction on the Greek passive discussed in section 3 (i.e. the fact that the implicit subject is necessarily an agent) is in conflict with the assumption made in L&R-H (1995) and Reinhart (2000, 2002) that the implicit external argument of alternating verbs can optionally be an agent or a causer. In turn, this suggests that the class of alternating verbs cannot be defined in terms of the nature of the external theta-role (unspecified external theta-role can be suppressed vs. specified external theta-role cannot) arguing against detransitivization.

Third, as shown in section 3, the generally accepted view that anticausatives lack an implicit external argument is challenged by PP-modification in the languages under discussion. If we take the grammaticality of *from*-PPs, *durch*-PPs and *apo/me*-PPs to point to the presence of an *implicit causer* in anticausatives, then the difference between passives and anticausatives cannot be expressed in terms of implicit arguments. The fact that agents are licensed only in passives and not in anticausatives suggests that the difference between the two has to do with agentivity. These considerations lead us to suggest that agentivity and causation should be syntactically represented in terms of distinct functional heads (see also Pylkkänen 2002). In what follows we will outline what we take to be a rough sketch of a solution to the discussed phenomena.

Building on and modifying Kratzer (2003), we adopt a syntactic decomposition of change of state verbs into a Voice and a CAUS component, as in (50), which we take to be the core structure of all (i.e., causative, anticausative and passive) change of state verbs:

(50)   [Voice [CAUS [Root]]]

CAUS introduces *a causal relation* between a causing event (the implicit argument of CAUS) and the resultant state denoted by the verbal root + theme.[14]

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[14] On this view, the postulation of a BECOME operator in the structural representations of anticausative (and causative) predicates (Dowty 1979) becomes superfluous (see Kratzer 2003 for discussion). Note that CAUS could also simply be seen as an eventive v of the type proposed in Marantz (2005), if we can ensure that this head can license causative PPs. In this case the causative semantics would

Voice is responsible for the introduction of the external argument and bears features relating to agentivity, and manner. Different features of Voice are involved in the formation of causatives, passives and anticausatives.[15] The presence of +/-agentive features is responsible for the licensing of Agent and Causer external arguments in active and passive constructions. Specifically, agentive Voice (VOICE [+AG]) licenses agents (and instrumental PPs); non-agentive Voice (VOICE [-AG]) licenses causers. If a VOICE head is active then the relevant thematic role is realised in its specifier; if it is passive, the relevant thematic role is implicit.[16]

In anticausatives, in principle there are two options: Voice might be totally absent or realised as VOICE [-AG] with an implicit Causer argument. We propose that the first option is available in all of the languages under discussion. Where languages differ is the availability of the second option. We expect languages to show the following two patterns of variation: (i) in a languages where the VOICE [-AG] head is possible in passives, anticausatives must appear without VOICE; (ii) in a language where the passive is necessarily agentive, the VOICE [-AG] head is free to be used in an anticausative interpretation. We propose that English and German instantiate pattern (i), while Greek realises pattern (ii) (see Alexiadou & Anagnostopoulou 2004 and Embick 2004). On the present view, there is no direction in the causative/anticausative alternation, as none of the two constructions is directly derived from the other.

The last component involved in the structure in (50) is the verbal root. We propose that roots fall into different classes depending on their Encyclopedic semantics (cf. also Bhatt and Embick in progress):

(51)   √agentive (murder, assassinate)
         √internally caused (blossom, wilt)[17]
         √externally caused (destroy, kill)
         √cause unspecified (break, open)

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not be directly encoded on any verbal head but results from the combination of an activity v and its stative complement (see Ramchand 2003 for related ideas).

[15] Cf. Kallulli (2005) for a proposal, according to which it is the presence of features such as [+intent] and [+caus] on v that distinguish between the agentive vs. causative interpretation of the external argument.

[16] We remain agnostic with respect to the specific syntactic implementation of implicit arguments, i.e. whether they are present in the form of a covert pronoun or just in terms of features on VOICE.

[17] For us, unergative predictes are not causatives, and hence cannot be classified as internally caused, contra L&R-H (1995) and in line with Marantz (1997).

All of the above roots combine with CAUS. 'Internal vs. external causation' categorization of the root influences the combinations of roots with particular types of Voice heads. Languages differ in how they treat externally caused roots. In German and English they form only the passive. In Greek (possibly also Hebrew, Doron 2003) they can form anticausatives. As will be proposed below, this depends on the parametric presence or absence of a particular type of Voice head in anticausatives.

Predicates like *murder* are based on roots that are externally caused but also agentive. For this reason they can only appear in the context of VOICE[+AG], and hence cannot form anticausatives in any of the languages under discussion.[18]

Roots like *blossom* are internally caused and hence combine exclusively with CAUS in all the languages under discussion (i.e. no thematic Voice head can be present), as they cannot be brought about by an external argument. It is crucial to note that they are nevertheless causative. A convincing piece of evidence is provided by modification by PPs.

(52) a. *The flowers wilted from the heat*
     b. *Der Baumstamm   verrottete durch   die Feuchtigkeit*
         The tree trunk   rotted   through   the humidity
     c. *To fito   anthise   me tin zesti*
         The plant blossomed   with the heat

In (52) the PPs necessarily introduce an indirect Causer.[19] We assume that this follows from the encyclopedic meaning of internally caused roots which tells us that properties of the internal argument are highly involved in the bringing about the change of state. Therefore, whenever these roots are combined with causers these can only be interpreted as indirectly facilitating the change of state of the theme. Note that while internally caused verbs do not transitivize they nevertheless can be causativized in the periphrastic causative construction, which expresses an indirect causation (Piñón 2001b). This means that the concept of internal causation does not exclude any type of causativization per se, but only direct causation which is necessarily expressed by the VOICE + CAUS combination.

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[18] Evidence for this comes from the fact that agentive roots are not licensed in derivational processes which cannot include Voice, for example adjectival passives in German (see Anagnostopoulou 2003).

[19] This is supported by the fact in (52c) only *me* is acceptable and not *apo* (see footnote 8).

Externally caused roots require an external argument and hence the presence of Voice, just like agentive roots. Unlike agentive roots which require VOICE [+AG], externally caused roots can also combine with VOICE [-AG]. We have pointed out that such roots (i.e. *destroy* and *kill*) do form anticausatives in Greek but not in English and German. We propose to account for this variation in terms of the proposal that VOICE [-AG] can be present in the anticausative structure in Greek while this is not possible in the other languages.

Finally, roots like *break* and *open* are unspecified for the type of causation involved (in the languages under discussion). This allows them to show up both with and without an external argument, i.e. they alternate.[20]

Turning to the licensing of PPs, we assume that adjunct PPs are licensed by structural layers that contain the relevant semantic features. The decomposition in (50) involves two types of licensing heads, Voice and CAUS, for the PPs under discussion. We propose that passive VOICE [+AG] licenses agent and true instrument PPs, and CAUS licenses causative *from-, durch-* and *apo-, me-* PPs. Note that the *from/durch/apo/me* phrases are interpreted causatively only in constructions in which CAUS is available. In constructions where such a head is not available (e.g. noun phrases), the prepositions have a different meaning (e.g. temporal, locative, source etc). Passive VOICE [-AG] licenses causer *by*-PPs in English (and causer *von*-PPs in German). Recall, finally, that the Greek passive differs from its English/German counterpart in that it allows only for agent PPs but not for Causer PPs. This suggests that the passive Voice head in Greek necessarily carries the feature [+AG] in the line with the proposal made above.

What explains the second difference between Greek and German anticausatives with respect to instrumental PPs (licensed in Greek but not in German)? We believe that this has to do with the distinction between 'pure instrument' and 'instrument-causer' proposed in Kamp and Rossdeutscher (1994), see also the discussion in L&RH (2005: 147 and references therein). Pure instruments presuppose either agentivity or volition both located in Voice, which is not present in anticausatives. They are licensed by Voice[+AG] obligatorily. Instrument-causers are 'Instruments which can be conceived as acting on their own, once the agent

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[20] There is a complication, though. Predicates like *break the world record* are necessarily agentive, hence they should behave like *murder*. It seems that the system deals with Agentivity specified on the root (*murder*) and Agentivity on the VP level (V+Obj combination, *break the world record*) differently. We leave this for further research.

has applied or introduced them' (from Kamp and Rossdeutscher (1994: 144). They are licensed by CAUS. The German preposition *mit* introduces exclusively instruments, which we take as evidence that they are associated with the pure instrument role. Therefore *mit*-PPs are compatible only with Voice[+AG]. The Greek preposition *me* introduces instruments but also causers and causing events, which we take as evidence that they are associated with the instrument-causer role. Therefore *me*-PPs are also compatible with CAUS.[21]

Finally, the *by itself phrase* asserts that there is no external argument that is responsible for the bringing about of the event hence modifying a CAUS head in structures that do not have an (implicit) external argument. This phrase is most comfortably used with verbal roots that are unspecified for causation, e.g. *break*, *open*, asserting that they are brought about without external causation. With predicates that are agentive or necessarily externally caused, they are ruled out because they lead to a contradiction,[22] and with predicates that are internally caused they are marginal because they are redundant. We argued that Greek can have anticausatives with *destroy, kill*. On the basis of our interpretation of the *by-itself* test, we predict that anticausatives of externally caused roots are not compatible with *by-itself*. The prediction is borne out:

(53)   *To paketo katastrafike   (*apo mono tu)*
          the parcel destroyed-**Nact** by alone its
          '*The parcel destroyed by itself'

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[21] Note that in German instrument-causers can also be introduced by *durch* in anticausatives, cf. fn. (7):
(i)   *Der Wunde heilte durch   die Medizin*
          The wound cured through the medicine
          '*The wound got cured through the medicine'
[22] It was pointed out to us by an anonymous reviewer that there is a grammaticality contrast between (ia) and (ib):
(i)   a.   *The window broke by itself*
          b.   **The window was broken by itself*
This is captured by our interpretation of the *by itself* phrase, which is in conflict with the presence of the implicit Agent in passives. Tom Roeper (personal communication) noted examples where the *by itself* phrase can appear in the passive as in e.g. *The FBI was investigated by itself*. In this case the *by itself* phrase modifies the implicit Agent. This option is presumably related to the fact that the NP FBI is a group noun so that we interpret this sentence as involving parts of the FBI investigating other parts of the organisation.

6. Summary

In this paper we developed an approach towards the causative/anticausative alternation which builds on a syntactic decomposition of verbs into a Voice and a CAUS component. We argued that the crosslinguistic variation in passives and anticausatives depends on the type and the availability of all or a subset of the above heads across languages. In particular, this variation depends on different types of Voice heads, a CAUS head and four ontological types of roots and various possible/impossible combinations thereof. The distribution of PPs in passives and anticausatives of different languages provides evidence for the presence of these heads.

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