

Peter Kosta (University of Potsdam, peter.kosta@uni-potsdam.de)

On the Causative/Anti-causative alternation as principle of affix ordering in the Light of the Mirror Principle, the Lexical Integrity Principle and the Distributed Morphology

Abstract

During the past 40 years research of causativity belonged to the central themes of the general and comparative resp. typological linguistics. In this respect it is astonishing, that in my opinion from the Slavic side this subject was treated if at all very marginally in the past. My interest was motivated by the fact that Causatives and Anti-Causatives require an analysis, which touches an interface of morphology, semantics, lexicon, word formation and syntax. Therefore it is also replicable by the Minimalistic Program (with the inclusion of Distributive Morphology). Furthermore, the theme comprises important observations concerning questions of affix ordering, syntactic structures and verb movement. Most syntactic accounts of affix ordering and verb movement follow the theory of incorporation by Mark Baker (1988). In this theory syntactic incorporation is assumed to be an instance of the general syntactic rule Move Alpha, e.g. a syntactic operation that derives morphologically complex words from morphologically basic elements (root, stems, or affixes) by head to head movement via incorporation. Whereas the traditional view on morphology and word formation is that word-formation takes place in lexicon, and that morphological rules are different in nature and apply on different primitive elements than syntactic rules, we shall try to advocate an analysis in which the phenomenon of Anti-Causatives and Causatives has to be derived from different ROOT-Semantics of verbs projecting different trees and syntactic structures by the operations AGREE and MERGE. The Causative Alternation (CAL) will serve as criteria to distinguish between externally and internally caused causation; with help of the CAL the Unaccusativity will be divided into two subgroups: alternating Unaccusative (AU-) verbs and non-alternating Unaccusative (NAU-) verbs. In the following an alternate distinction between AU- and NAU-verbs will be developed, namely the presence/absence of information about how the process to be treated was caused. The universal concept of the encyclopedic lexicon in English, German, Russian and Czech (partly also other European and non European languages) seems to assume four different ROOTS of verbs at base to classify the Anti-Causativity-Opposition:

- ✓ agentive (murder, assassinate, cut),
- ✓ internally caused (blossom, wilt, grow),
- ✓ externally caused (destroy, kill, slay)
- ✓ cause unspecified (break, open, melt).

Moreover, it will be shown that unergative/causative pairs depict an independent phenomenon, which does not affect considerations about CAL (correspondent to Alexiadou et al. 2006a, b, Kosta 2010, 2011; and Marantz 1997, but dissenting Levin & Rappaport Hovav 1995 and Reinhart 2000).

This talk is organized as follows: in section 1, I propose a formulation of the MP based on syntactic features; the examples will be taken from Causatives and Anti-Causatives that are

derived by affixes (in Russian, Czech, Polish, German, English and some other languages of different types and origins) by head-to-head movement.

In section 2, I review some basic facts in support of a syntactic approach to Merge of Causatives and Anti-Causatives, proposing that theta roles are also syntactic Features that merge functional affixes with their stems in a well-defined way. I first try to give some external evidence in showing that Causatives and Anti-Causatives obey a principle of thematic hierarchy early postulated in generative literature by Jackendoff (1972: 43), and later reformulated in terms of argument-structure-ordering principle by Grimshaw (1990:chapter 2).¹ Crucial for my paper is the working hypothesis that every syntactic theory which tries to capture the data not only descriptively but also explanatively should descend from three levels of syntactic representation: a-structure where the relation between predicate and its arguments (and adjuncts) takes place, thematic structure where the theta-roles are assigned to their arguments, and event structure, which decides about the aspectual distribution and division of events.

1. Mirror Principle and Functional Hierarchies

1.1 Preliminary Observations and Comments

The starting point of controversy between two fundamentally opposing theoretical viewpoints can be briefly sketched in the following: (1) the syntactic approach is that all morphological operations, ie of shape-forming processes from single stems or roots to phrases starts of taking non derived lexical items from a list (call it lexical array, LA), and combining them via a simple operation, ie external (and possibly internal) MERGE in the corresponding search-goal domain (Chomsky 2005; Krivochen & Kosta 2013). If the ‘features’ of two lexical items ($LI_{(\phi_1)}$ and $LI_{(\phi_2)}$) can be read off at one of the interface levels (S-M or C-I), they will be valued against each other and finally erased building a complex phrase following and extended by the (semantic) principle of Dynamism of Full Interpretation (cf. Krivochen & Kosta 2013:70)². Both valued and not valued features are subject of a mandatory syntactic operation **Merge**, but the information increases or decreases independently of the S-M-interface. (2) As opposed to this, in the LFG approach grammatical-function changing operations like passivization are said to be lexical. This means that the active-passive or causative-anti-causative relation, for example, is a relation between two types of verb rather than two trees. Active and passive verbs are both listed in the lexicon, and involve alternative mapping of the participants to grammatical functions. There are some alternatives in recent literature to the two mentioned alternative approaches, which we cannot mention here (cf. Putnam (Ms.), Putnam & Fabregas (in press)).

Through the positing of productive processes in the lexicon and the separation of structure and function, LFG is able to account for syntactic patterns without the use of transformations

¹ This paper is not yet fully developed but will be part of the presentation at BASEES, Cambridge, April 2-4, 2014. Any comments are highly appreciated.

² The DFI only enlarges the notion features from the viewpoint of semantics thus that any derivational step is justified only insofar as it increases the information and/or it generates an interpretable object (cf. Krivochen & Kosta 2013:71, ex. 70):

(70) **Dynamic (Full) Interpretation (DFI):** any derivational step is justified only insofar as it increases the information and/or it generates an interpretable object.

defined over syntactic structure. An alternative approach is a theory of thematic representations proposed by Grimshaw (1990). To both alternatives, I shall return in theoretical part 2.

Let us consider two simple examples from causative and anti-causative formation as presented in Kosta (2010) and Kosta (2011). Causative constructions (hereafter CC) are grammatical expressions, describing a complex situation which consists of two components (Song 2001: 256-259): (i) the causes event (CAUSER-EVENT), where the CAUSER initiates or causes something and (ii) the caused event (CAUSEE-EVENT/STATE), where the CAUSEE is doing an action or is subject to a change of state, as a result of the initiated or caused action of the CAUSER³. The following Japanese sentence describes such a situation of causativation:

- (1) Kanako ga Ziroo o ik-ase-ta Japanese
 Kanako_{NOM} Ziro_{ACC} go_{_CAUS_PAST}
 "Kanako made Ziro go."

In (1) the intransitive Verb *ik* ‘to go’ and the causative affix *-ase-* clearly combine into a single word at some stage of derivation. Thus we are led to an analysis similar to one developed in Baker (1988:147-149) where CC in English and Chichewa (Bantu) in (2) and (3) are treated as Verb incorporation:

The English sentences in (2ab) are biclausal in all respects. In particular, they are biclausal in meaning, with an embedded clause appearing as a semantic argument of the causative predicate in the main clause. For each of the two clauses, two morphologically different verbs are to be seen: make (as the causative verb) and leave break respectively. The Chichewa and

³ Mugari (2012) calls this type of Causative Analytic (periphrastic), which like the morphological one is regarded as productive. An analytic causative is defined by Kemmer and Verhagen (1994:117) as a two-verb structure that expresses a predicate of causation and a predicate of effect. These employ certain causative verb meaning ‘cause, force, make, have’ to name the causing EVENT, followed by verbal complements that name the caused EVENT or effect as exemplified below.

sentence (3) is exactly the same biclausal type of sentence, but (4) and (1) are only similar semantically, but there are differences in morphology and syntax. Japanese and Chichewa contain only one verb each which happens to be morphologically complex. In addition, sentences like (4) can be paraphrases of (3).

In our analysis (Kosta 2010, 2011), we have shown that both types of CC – the biclausal and the monoclausal or better monolexical - can be found in Slavic languages, here demonstrated in Russian, Czech and Polish:

- | | | |
|-----|--|----|
| (5) | a. Bill <i>nechal jeho sestru odejít dřív, než film začal.</i> | Cz |
| | b. Козел <i>заставил меня сломать любимую вазу моей матери.</i> | Ru |
| | c. Bill spowodował, ze siostra odeszła, zanim film się zaczął. | Pl |
| (6) | a. Dívka upustila sklenici na zem. // | Cz |
| | The girl _{Nom} dropped a glass _{Acc} on the floor _{Acc} | |
| | b. Dívce spadla sklenice na zem. | |
| | the girl _{Dat} fell a glass _{Nom} on the floor _{Acc} | |
| | c. Devushka uronila stakan na pol | Ru |
| | girl _{Nom} dropped glass _{Acc} on floor _{Acc} | |
| | d. U devushki upal na pol stakan. | |
| | at girl.Gen fell on floor.Acc glass.Nom | |
| | e. Dziewczyna upuściła szklankę na podłogę. | Pl |
| | The girl _{Nom} dropped a glass _{Acc} on the floor _{Acc} | |
| | f. Szklanka wypadła dziewczynie na ziemię | |
| | a glass _{Nom} fell the girl _{Dat} on the floor _{Acc} | |

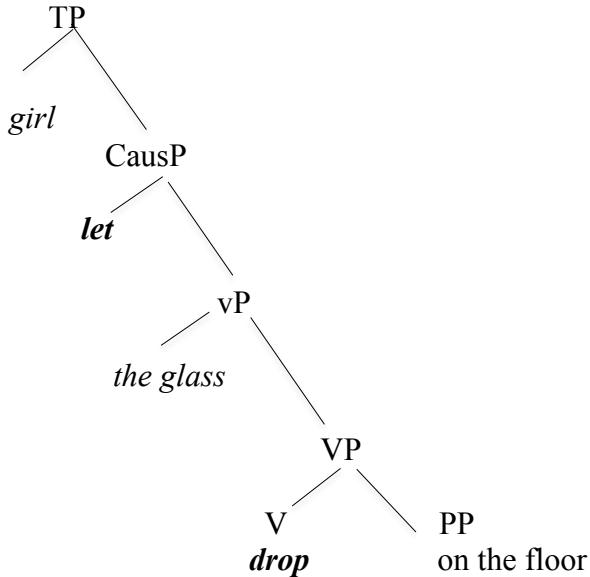
The examples (6a-f) are not just a translation of a periphrastic causative construction (CC): *The girl let the glass drop on the floor.* (6a/c/e) is the incorporating type of a CC, where the prefix '*u*' (presumably base generated in a head CAUS⁰) attracts and then incorporates the verbal head of the lexical verb V⁰ via head-to-head-movement, making of a lexical verb a causative verb which now assigns to the chain *sklenice* trace accusative case.

The semantic differences between a periphrastic CC and its incorporated counterpart are also to be mentioned: For instance, (6c) does not imply that the girl dropped the glass herself, this is just the most salient interpretation. The glass could fall by itself or be dropped by somebody else (although this is a more problematic interpretation, but one can imagine a context for it). The semantic difference between these two types of CC are even bigger if we take the AC-clauses in (6b/d/) which only imply that the glass is related to the girl (it belongs to her, or she works in a bar and handles glasses etc.). The prefixes and stems of the incorporating CC and the incorporating A-C are apparently different: If one wants to stress that the glass fell accidentally, one can either say 'devushka vyronila stakan *iz karmana*' (you can 'uronit' something on purpose, but normally not 'vyronit' - unless you have specific contexts where e.g. you pretend that you did something accidentally) or 'stakan vypal/vyskol'znul u devushki iz ruk' ('the glass slept out of the girl's hands'), cf. (iii).

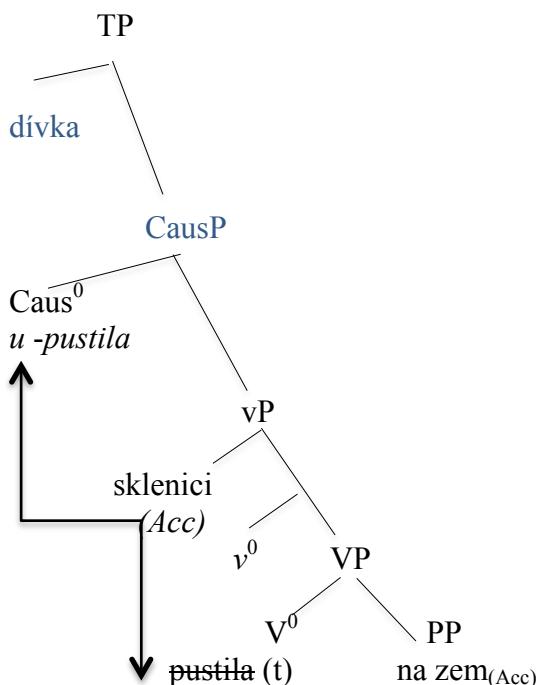
The fact, that there is a semantic difference between (6a/c/e) vs. (6b/d/f) will have consequences for a syntactic theory of causation as put forward in section 2 of this paper.

Thus, if we want to mirror the semantic difference between the periphrastic CC, the incorporating type of CC and the AC type, we should mirror it in syntax as follows:

(i) *CC of the periphrastic type*

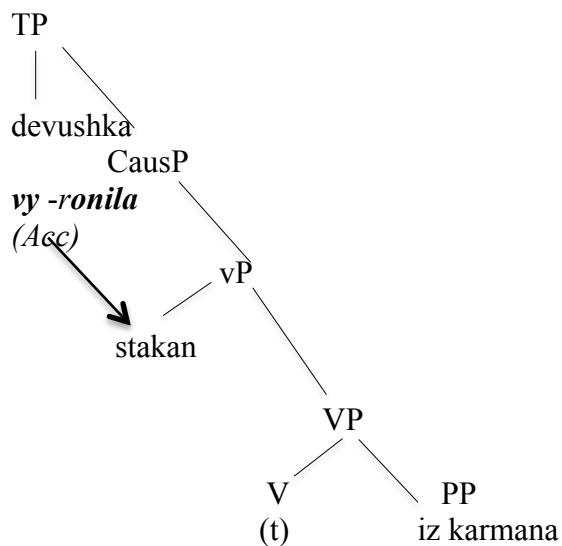


(ii) *CC of the incorporating type*

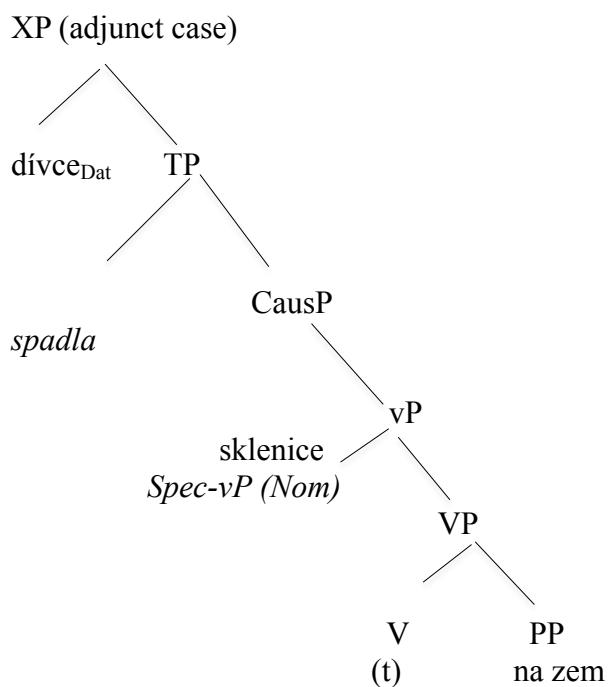


(6a) Dívka upustila sklenici na zem (Cz)

(iii) Direct AC 'devushka vyronila stakan iz karmana' (Ru)



(iv) Indirect type of AC (6b) Dívce spadla sklenice na zem = (6d) = (6f) (Cz)
the girl_{Dat} fell a glass_{Nom} on the floor_{Acc}



The periphrastic CC and the incorporating CC alternate with so-called Anti-Causative Constructions (ACC), as we can further observe under (7) vs. (8) in which anti-causativity is expressed by adding to the same transitive verb *otevřít* ‘to open’ an anti-causative marker *se – homonymous to the Reflexive se-verbs* - an operation which not only changes the syntactic structure (reducing or absorbing the external Agent argument or Causer *Petr* and moving the internal Theme argument *dveře* to the specifier position of a Cause Phrase) but also the Case and the surface structure.

- (7) Petr otevřel dveře Cz
 [Petr VoiceP [CAUS [dveře √otevřel]]]
- (8) Dveře se otevřely
 [SpecCaus the door [CAUS [the door √open]]]

In Krivochén’s paper, the presence of a functional projection of voice in (7) (as argued for in Kosta 2010, 2011 following Schäfer 2008 and Alexiadou 2006) is rejected whereas the presence of a CAUS projection is accepted (cf. his reasoning in ex. 9, p. 5).

Our arguments in favor of a Voice head come from the syntactic restrictions on passivization in one class of the verbs where the causer remains unspecified. This is exactly the example (8) where – as Krivochén admits – the Causer remains unspecified. This can be confirmed by the fact that only this class of verbs allows the Causative alternation as demonstrated under (7) vs. (8) where also a passivization of (8) is disallowed resulting in an ungrammatical sentence:

- (9) Dveře se otevřely (*Petrem) Cz
 door AC opened
 (The) door opened (*by Peter)

Krivochén discusses these examples and rejects the presence of a voice projection at all for economy of representation. This is in fact due to the fact that Krivochén does not differentiate between controlled Cause by an animate Agent (Fillmore’s semantic case ‘agentive’, cf. also Kosta 1992) and Cause in the narrow sense (which would correspond to the inanimate cause including also physical and other sources of cause). The empirical facts, however, show the importance and give me the justification and good arguments for such a differentiation because it is mirrored not only on the level of Phonology and Morphology (be it epiphenomenal or not) but in Syntax, mapped from Semantics! With other words, the ordering and mapping of Roots into the RS and Syntax are not just epiphenomenal but follow and reflect deep-rooted semantic differences and features of the Lexicon projected into the syntactic structure.

For instance, Schäfer (2008) and Alexiadou et. al. (2006) justify the need for VOICE projections in the light of empirical data and contrasts like the following (taken from Kosta, 2011: 284):

- | | |
|--|-------|
| (10) a. John / the explosion / Will's banging broke the window. | Engl. |
| b. John / exploze / rána Willa rozbil(a) okno | Cz |
| c. Okno bylo rozbito Johnem / explozí / ránou Willa | |
| (11) a. *The window broke by John / by the explosion / by Will's banging | Engl |
| b. *Okno se rozbilo Johnem/ explozí / ránou Willa | Cz |

Spanish (a Romance language) allows constructions of the type of (12), as in:

- | | |
|--|---------|
| (12) La ventana se rompió por la explosión | Spanish |
|--|---------|

Kosta (2010) notices this fact, and makes the caveat that an agent cannot be introduced by means of a PP:

- (13) *The window broke from Mary

However, the mistake here seems in view of Krivočen the preposition choice, as (14) is grammatical:

- (14) The window broke because of John

While I take it that examples such as (10) in passives are grammatical, I repeat that all examples in (11) are ungrammatical and they should by prediction be excluded: an animate Agent is excluded because in these examples there is only a Causative phrase which projects a Causative with an inanimate adjunct which adjoins to the specifier of the CausP and not a Voice P). Krivočen himself admits that examples such as (12) (in his paper ex. 14) in Romance languages are grammatical. But this is because 'explosion' by definition is not agent but causa. Thus, Krivočen's example (12) is misunderstood because it does not contradict our prediction that Anti-Causatives cannot be passivized⁴, which can be seen in (14') in which the by-Phrase is an instance of agentive PP in Passives in English:

- (14') *The window broke by John

It is not true that the preposition 'from' in (13), repeated here as (13') is the reason for the ungrammaticality :

- (13') *The window broke from Mary

Actually, the same ungrammaticality would result if we put the preposition 'by' typical for Agent-by-Phrases in engl. Passives (cf. 14'). The reason why I took these examples was misinterpreted or mistaken in Krivočen's statement (paper). The actual reason why I introduced these non-trivial examples was to show that by-Phrases (with an animate Agent argument) can only be introduced in engl. Passives but not in AC (Anti-Causatives, which by definition cannot be passivized), and this was an additional argument to state that only

⁴ In his functional contrastive Grammar Czech-German, which is far from being under the suspicion of Generativism Štěcha (2003:489) stresses that „Kauzativní predikace se zpravidla nerealizuje pasivním rodem.“ (Causative predication usually is not realized with passive voice)

Passives (which are in 90 % of all examples derived from transitive Actives by NP-Movement) project a Voice Phrase where the Agent takes the position of an adjunct due to the presence of a passive morpheme Argument (cf. Kosta 1992, chapter 5, citing Baker, Johnson, Roberts 1989, confirmed also in). The reason why Krivochen's example (14) is grammatical is because the phrase 'because of John' is not an example for an Agent phrase but an example of a CausP. This is also precisely born out in my theory because the verb 'to break' belongs to the class of verbs that do not have an agent (VoiceP) but an unspecified or underspecified Cause Phrase. Alternatively, we can interpret Krivochen's example as an adjunct clause, in which 'because of John' is in fact a part of a sluicing (IP-ellipsis)⁵.

For the same reason, I have introduced analytic Passives in Slavic and demonstrated that they behave in a different manner than so-called impersonal *se/si*-Passives in Slavic and Romance. While only the latter disallow Agent *by*-Phrases (being ergative/unaccusative verbs or impersonal passives), the first can at least allow for an optional Instrumental phrase, which is the exact equivalent to the Agent *by*-Phrase in English. I repeat here the arguments in favor of our analysis from Kosta (2010:256passim).

The discussion of the causative alternation – as discussed and developed in many influential articles and monographs (cf. Marantz 1984; BJR 1989; Kosta 1992, 2010, 2011; Levin – Rappaport Hovav 1995; Reinhart 2000 and Schäfer 2008, Alexiadou 2006ab, recently also in Schäfer, in print) – has repeatedly shown – and this is proven facts - that Passives proper (in this sense I speak about the analytical Passives in Indo-European Languages) and anti-causatives differ in the following aspects: (A) modification and control, (B) verbal restrictions in the case of passivization.

(A) Modification and control

Passives, but not anti-causatives can be modified (i) by an Agent *by*-phrase, (ii) by Agent-oriented Adverbs (so-called subject adverbs) and (iii) by control in embedded final sentences:

(i) Passive-Agents vs. *Anti-Causative Agents

⁵ To see the difference between a strict intensional and an extensional approach to semantics of natural languages, one has to consider the following examples (i) *Das Bett krachte in der Nacht zusammen *durch den Peter* (✓ wegen des Gewichts von Peter), 'The bed crashed down in the night *by Peter (✓ because of the weight of Peter)', (ii) *Der Student brach zusammen (wegen Überanstrengung)* 'The student collapsed (due to overexertion)' vs. (iii) *Dveře se otevřely (*Petrem) door AC opened* '(The) door opened (*by Peter). As one can see, here we have again examples where the cause of breaking down/falling apart/collapse has a 'reason', but the reason is explained in a PP which is an *adjunct*, thus it is not a part of our intensional system but of extension of possible worlds (cf. also Zimmermann, in press). However, as we shall see under section 2, there are different types of adjunct. The occurrence of some can be explained linguistically (so-called a-adjuncts), others, extra-linguistically. The make up of this differentiation is based upon the difference between intensional semantics and extensional semantics of possible worlds. It follows, that we should differentiate between a CAUSER (someone animate) or CAUSE (a physical entity or a psychological, cognitive, inner entity of the subject) which is a semantic (intensional) property (in fact a Theta-role) of the predicate and a 'cause (cW)' or 'reason (rW)', 'source of trouble' (stW) etc. which is an extensionally given class of possible worlds (W), not already encoded in language. This would be reasonable also due to the fact that Montague makes the distinction in PTQ?

- (15) a. The boat was sunk by Bill. (Passive) Engl.
 b. *The boat sank by Bill. (Anti-Causative)
- (16) a. Das Boot wurde durch Bill versunken. (Passiv) Germ
 b. *Das Boot sank durch Bill. (Anti-Causative)
- (17) a. Lod'byla potopena Bilem. (Passive) Cz
 b. *Lod' se potopila Bilem. (Anti-Causative)
- (18) a. Lódz została zatopiona prez Billa. (Passive) Pl
 b. Lódz zatonięła *przez Billa (Anti-Causative)
- (19) a. Лодка была потоплена Биллом √ (Passive) Ru
 b. Лодка затонула *Биллом. (Anti-Causative) Ru

(ii) Agent-oriented Adverbs

- (20) a. The boat was sunk by purpose. Engl.
 b. *The boat sank on purpose.
- (21) a. Das Boot wurde absichtlich versenkt. Germ.
 b. * Das Boot sank absichtlich.
- (22) a. Lod' byla potopena naschvál/záměrně Cz
 b. * Lod' se potopila naschvál/záměrně
- (23) a. Został celowo zatopiony jacht Pl
 b. Łódź zatonęła celowo
- (24) a. Лодка была намеренно потоплена Ru.
 b. * Лодка затонула намеренно

(iii) Controll into embedded sentence

- (25) a. [[IA_arb] The boat was sunk [PROarb] to collect the insurance] Engl.
 b. *The boat sank to collect the insurance.
- (26) a. [[IA_arb] Das Boot wurde versenkt, Germ
 [PROarb] um eine Versicherungsprämie zu kassieren]
 b. *Das Boot sank, [[PROarb] um die Versicherungsprämie zu kassieren].
- (27) a. Lod' byla potopena, [aby [PROarb] se dostali peníze od pojišt'ovny] Cz

- b. *Lod' se potopila, [aby [PROarb] se dostali peníze od pojišťovny]
- (28) a. Łódź została zatopiona, [[PROarb] żeby wyłudzić premię ubezpeczną]Pl
- b. *Łódź zatonęła, żeby [[PROarb] wyłudzić premię ubezpeczną]
- c. Łódź_{ACC} zatopiona_{ACC} [[PROarb], żeby wyłudzić premię ubezpeczną]
- (29) a. Лодка была потоплена [[PROarb], чтобы получить страховую премию]Ru
- b. *Лодка затонула [[PROarb], чтобы собрать страховку]

(B) Syntactic Restrictions:

Theoretically, every transitive verb can be passivized. However, a minor subclass of transitive verbs can also form anti-causatives and thus, by definition, cannot be passivized. This will be demonstrated with the examples of four verb groups. Every extension of a verbal projection is only really projected if the head in the lexicon bears its categorial features, giving the following verbal roots:

- (i) ✓ agentive verbs (murder, assassinate, cut) project a causP and a voiceP (+ caus, + voice)
- (ii) ✓ internally caused (blossom, wilt, grow), project only a CausP (+ caus)
- (iii) ✓ externally caused (destroy, kill, slay) project a voiceP and a CausP (+voice, +caus)
- (iv) ✓ cause unspecified (break, open, melt) project only a voiceP (+voice)

I believe that w.r.t. the feature CAUS and VOICE one can classify all verbs.

- (i) Group: to break, brechen, rozbít

- (31) a. Bill broke the glass.

- b. Bill zerschlug das Glas.

- c. Bil rozbil sklo.

- (32) a. The glass was broken by Bill.

- b. Das Glas wurde von Bill zerschlagen.

- c. Sklo bylo rozbito Bilem.

(33) a. The glass broke.

b. Das Glas zerschlug.

c. Sklo se rozbilo.

(ii) Group: *to cut, schneiden, krájet, stříhat, řezat*

(34) a. The baker cut the bread.

b. Der Bäcker schnitt das Brot ab.

c. Pekař krájel chléb.

(35) a. The bread was cut by the baker.

b. Das Brot wurde vom Bäcker abgeschnitten.

c. Chléb byl krájen pekařem.

(36) a. *The bread cut.

b. *Das Brot zerschnitt.

c. *Chléb se ukrojil.

(iii) Group *to read, lesen, číst*

(37) a. John read the book yesterday.

b. Johann las das Buch gestern.

c. Jan četl včera knihu.

(38) a. The book was read yesterday by John.

b. Das Buch wurde von Johann gestern gelesen.

c. Kniha byla čtena včera Janem.

- (39) a. *The book read yesterday.
 b. *Das Buch las gestern.
 c. *Kniha se četla včera. (only the impersonal passive is possible)

Concerning the two differences, namely modification and control, it is generally agreed that the reason is the presence vs. absence of implicit external arguments in passives vs. anti-causatives. The fact that passives contain an implicit external argument can – according to the passive theory of Baker, Johnson and Roberts (1989) – be explained by the fact that Passives are derived by NP-Movement.

1.2 Affix Ordering in Morpho-Syntax and Semantic Classes

As we shall see below, the type of CC and the CAL is dependent on the semantic class of verbs, which we will distinguish in the following four groups.

- (i) ✓ agentive (murder, assassinate, cut),
- (ii) ✓ internally caused (blossom, wilt, grow),
- (iii) ✓ externally caused (destroy, kill, slay)
- (iv) \cause unspecified (break, open, melt).

These semantic classes are subject to both morphological and syntactic restrictions.

Let us first recall some basics regarding the morphology and word formation of causatives and anti-causatives.

1.2.1 A First Approximation on Causative vs. Anti-Causative Morphology

1.2.1.1 Anti-Causatives and the Unaccusative-Unergative Opposition (Perlmutter 1978, Burzio 1986)

Since Perlmutter's formulation (1978) of the Unaccusative Hypothesis (UH) most theories classified intransitive verbs as either unaccusatives or unergatives. The terminology of argument structure of the UH proceeds from the assumption that "unaccusative predicates select a single internal argument, while unergative predicates select a single external argument" (cf. Harves 2009:415). In syntax unaccusative predicates project their subjects VP-intern, namely in the position of direct object (DO), while unergative predicates project their subjects VP-extern, similar to transitive verbs projecting basis-generated subjects. My own understanding of the syntactically different entity of unaccusative predicates can be traced back to my joint work with Jens Frasek (Kosta, Frasek 2004), where we developed several syntactic tests, which can be considered as relatively reliable objective empirical means and instruments of diagnosis – not only based on mere logic of argumentation or not proven hypothesis – for the differentiation between both verb classes of intransitive verbs both

globally and cross-linguistically. For instance, Perlmutter (1978) demonstrated that the impersonal passive in Dutch can only derive from real unergative, but not unaccusative predicates, as can be shown by the contrast between (40) vs. (41):

- (40) Dutch impersonal passives < unergative predicates
- a. Er wordt hier dooor de jonge lui veel gedanst.
It is here from the young people much danced
“It is danced much by the young people”
 - b. Er wordt in deze kamer vaak geslapen.
It is in this room often slept
“It is slept often in this room” (Perlmutter 1978:168)

- (41) *Dutch impersonal passives < unaccusative predicates
- a. *Door de lijken wird al ontbonden.
From the corps is already decomposed
 - b. * In dit ziekenhuis wordt (er) door de patienten dikwijls gestorven
In this hospital is (it) from the patients often died
(Perlmutter 1978:169)

As we have already seen, one of the syntactic characteristics of intransitive verbs that differentiate between unergatives and unaccusatives is that unergatives seem to have an external argument as base derived subject with the Theta role ‘agent’ while unaccusatives derive their subject via internal movement (or remerge) from the internal argument position and the Theta role is Theme or Patient. This is also the reason why the two structures must be derived in two different ways:

- (42) a. Unaccusative Verb: [VP V NP]
b. Unergative Verb: NP [VP V]

- (43) a. Человек падает.
b. Muž padá.
c. Der Mann fällt.
‘The man falls’

- (44) a. Человек смеется.
b. Muž se směje.
c. Der Mann lacht.
‘The man laughs’

The same distinction can bee seen in the following pairs:

- (45) Der Schwimmer ertrank

The swimmer drowned

- (46) Das Boot sank

The boat sank

In Slavic languages we often express this difference in terms of different affixes, as opposed to German and English which usually expresses the difference with different lexical stems. In Slavic languages such as Russian and Czech, the ‘unergativity’ and ‘unaccusativity’ affixes at the same time express ‘telicity’ and the achievement or result of a process or change-of-state, e.g. the perfective aspect. This is why we assume that the functional projection of Aspect must be above the lexical VP but below the light vP which projects the external argument (either as base generated external subject in case of unergatives or as derived subject, remerged from the position of internal argument – deep object in case of unaccusative):

- (47) a. Пловец утонул (unergatives)

b. Plavec **se** utopil

c. Der Schwimmer ertrank

d. The swimmer drowned

- (48) a. Лодка затонула (unaccusatives)

b. Lod' **se** potopila

c. Das Boot sank

d. The boat sank

Despite all superficial similarities in morphology, semantics and syntax, my working and leading hypothesis in this paper is the following: As opposed to these examples of unergativity (47) and unaccusativity (48), in which the causation is typically not projected – and this is the reason why I would not consider unergatives or unaccusatives as synonymous to anti-causatives or to verbs taking part in causative alternation (CAL) – with causative verbs proper causation is expressed by a usually non-active subject. In a broader sense, we can include to the definition of CAL also verbs where the causation is initiated but not expressed in direct way, cf.:

- (49) a. Ты меня напугал (Causative)

b. Ty jsi mě polekal.

c. Du hast mich erschreckt

d. You scared me

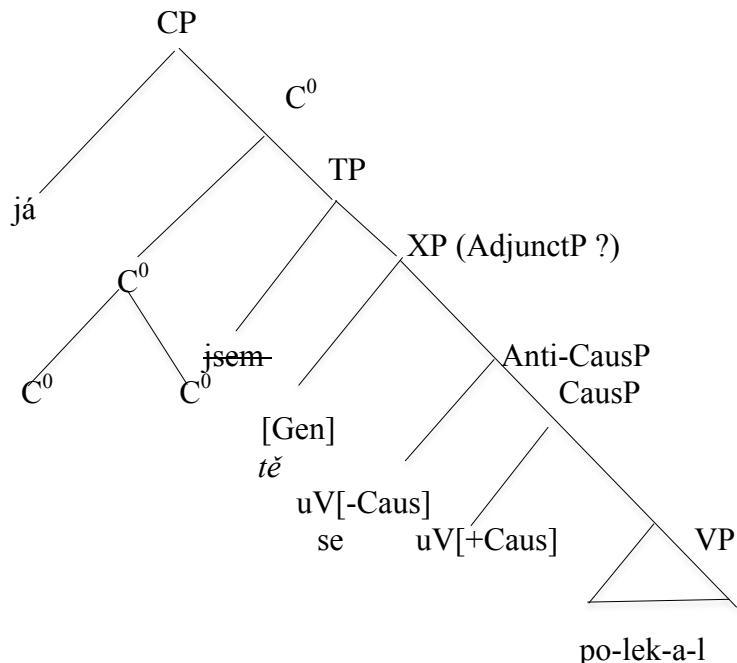
- (50) a. Já jsem se tě polekal (Anti-Causative)

b. Ich erschrack vor dir

c. I was startled by you

The kind of ‘event’ by which the subject (‘causer’) has initiated the effect on the object (‘causee’) is not assigned Theta role AGENT because the addressed person *ty* ‘you’ is just the CAUSER and not the agent of the psychological state or effect which has been caused in the object (causee). This caused psychological state or process is expressed with the reflexive form *polekal jsem se* and in German with an impersonal form of the predicate *ich erschrack / ich bin erschrocken*. The same content which is expressed by the Czech clause *ty jsi mě polekal*, German *du hast mich erschreckt*, English *you scared me*, Russian *Ты меня напугал* can be expressed with a construction in which the holder of the psychological state ‘being scared’ caused by the Causer is merged to the subject position giving the structure:

(51)



The order of affixes corresponds to the order of functional projections and according to MP (Baker 1988). The sentence *ty jsi mě polekal* is the causative equivalent where the subject *ty* is in SpecTP and then remerged in SpecCP, *jsi* (AUX) is merged in T⁰ and then remerged in C⁰, for independent reasons⁶.

- (52) a. Já jsem se tě polekal (Anti-Causative)
 b. Ich erschrak vor dir
 c. I was startled by you

I take it that this position is not – as assumed in Kosta (2011:289) – just a transformation of the transitive clause (with a light vP) but that this in fact is a Anti-Causative projection not equivalent with a VoiceP nor with a CausP (against Schäfer 2008 and Schäfer, in print and p.c.).

A quite compelling evidence for this assumption I have found in pairs traditionally regarded as taking part in CAL, in which the Theta-roles change in the following clauses taken from Pesetsky (1995:56)⁷:

⁶ The reason is that the auxiliary and the pronoun are clitics, following the linearization according to the principle of Clitic Templates from Kosta, Zimmerling (2013) and Zimmerling, Kosta (2014).

⁷ The first example (53a) seems to be problematic because of the use of the preposition 'at' in (53a) Bill was very angry at the article in the [Times], 'at' would really be reserved for + animate, maybe even *at + human*. He was angry about the cat or He was angry at the cat? If it the clause personalized cat like ours at would be possible

(53) a. Bill was very angry at the article in the [Times] [Target]

b. The article in the [Times] angered/enraged Bill. [Causer]

The truth conditions of the two sentences are noticeably distinct. For (53a) to be true, Bill must have evaluated the article, and he must have formed a bad opinion of some aspects of it based on emotional or rational arguments. In other words, Bill must find the article objectionable at some point. In (53 b), the situation is different: Bill might be mad at the article in (53 b) as well - the meaning of (53b) is not consistent with (53a). Nonetheless, (53b) is appropriate even if Bill thinks the article is splendid. It can be true, for example, if Bill's favorite columnist has written, in Bill's opinion, a great article revealing examples of government corruption. Thus, the article does CAUSE Bill to be angry, but the article itself is not the real Target of his anger but maybe someone described or something inside the article, but Bill is not necessarily angry at the article itself.

I believe that many examples of this sort makes the distinction between causative verbs and anti-causative verbs quite clear. Anti-Causative verbs like the a examples (also in 54a) are anti-causatives in which there is no evidence for an explicit causer, cf.:

(54) a. John worried about the [television set]. [Subject Matter]

b. [The television] set worried John [Causer]

In (54a), whenever John experienced the worry described in the example, he was thinking in some way about the television set. Perhaps he was worried that it might catch fire, or that it was perched too precariously and might fall. Whatever the real nature of John's specific concern was, [the television set] in (54a) is the Subject Matter of Emotion. In (54b), however, the DP [the television set] bears now the familiar role of Causer. There is a causal relationship between the set and some state of worry.

Especially because the so-called Causative Alternation does not maintain truth conditions it seems that we really need - also for semantic reasons - to take two different argument-theta-role hierarchy for CausP (for causatives) with an explicit agent or Causer and Anti-Caus (for anti-causatives) with a suppressed or implicit agent or causer. This difference will not only be reflected by different syntactic projections but also by the fact that we have different Theta-roles and a different a-structure (cf. in section 2).

maybe a human cat Reeve. You can be mad at someone, not at something. [53c] Bill was very angry *about* the article in the [Times]. I further believe 'at' can only be used if the anger is directed at animate addressees like in [53d] Bill was very angry at the author of the article in the [Times]. Paul Postal confirmed my feeling stressing: „Paul M. Postal 4:22 PM (1 minute ago) “to me It’s a very subtle point but I think the Deutsche Sprachwissenschaftler is right”. (p.c. Christina Behme).

1.2.1.2 Higher Subjects: Benefactive or Experience Dative Subjects in Impersonals vs. Anti-Causatives

Anti-Causatives typically resemble intransitive or impersonal constructions⁸ in which the surface subject is the Patient or Theme (promoted - similarly to unaccusatives - from the internal object argument position) assigned Nominative, whereas the other argument often appears in a semantic (or inherent) Case such as Benefactive or Experiencer Dative depending on the semantics of the predicate. In the following clause, the expression of Dative is associated with a Benefactive (Theta Role):

- (55) Tento román se *mi* *dobře čte*

This novel_{Nom} Refl to me Cl_{Dat} well reads

“I like to read this novel”

This type of impersonal construction, which Genuisene (1987:289) classifies as ‘modal-deagentive reflexives’ and Kemmer (1990:150) calls ‘propensative’ use, is used to imply that the reasons for an action or lack of action are not internal but external: the animate human Dative Subject is not responsible for his or her ability or inability to perform action, nor for its quality (Zolotova 1985:90). This class of verbs are not transforms of their potential active transitive counter-examples:

- (55) ≠ (56) Čtu tento román dobré
pro read this novel well

We will not comment on this here, but will try to take up these and similar examples in section 2.

2. On Merge, Mirrors and syntactic derivation of Causatives and Anti-Causatives

2.1 Recent approaches on Derivation of grammatical categories: Theta hierarchy and Argument structure hierarchy

⁸ Cf. Kosta (2009) on impersonal constructions.

Despite the above mentioned classical literature on derivation of phrases – which we do not mention here – in recent approaches (cf. Williams 2007, 2008) it is assumed that there at least five grammatical processes which target heads, in that they attract them or attach things to them: Affix Hopping, Morphological Lowering, Verb or Head Raising, and less obviously, Adverb Placement and the basic Merge operation. Edwin Williams' recent proposal tries to unify all these Mirror effects under the label 'COMBINE': "Mirror effects arise under COMBINE but are size-relative, because COMBINE is parameterized for the size of the targeted head, where the values are 'XP', 'X', 'stem', and 'root'." (cf. Williams 2008:1). Before we come to a detailed analysis of the derivation of grammatical categories, we want to show how the theta-hierarchy and argument structure of Causatives (CC) and Anti-Causatives (AC) vs. Nominals, Passives, and Adjectival Participles can be linked to each other.

In traditional generative framework, hereafter abbreviated as MGG (for mainstream generative grammar), argument structure was equated with the number of arguments related by predicate. With the increasingly important development of the P & P framework, especially very fruitful and influential in many contributions on Government and Binding (LGB, Chomsky 1981, Kosta 1992), the Theta Criterion and the Projection Principle have been introduced as quite powerful means to capture the descriptive adequacy of the theory of grammar. This happened on par with a further development of lexicalist theories like Lexical Functional Grammar (Bresnan 1982). In all these approaches, one reasonable idea has been pursued, namely, how can the information in lexicon provide an explanation of syntax, or, to be more modest, how can a theory of argument structure explain properties such as adjectival and verbal passives, middles, light verb constructions (e.g. unaccusatives), verbal compounds, causatives, and nominals, among other topics (Levin and Rappaport 1986, 1988; Zubizarreta 1985, 1987; Grimshaw 1986, 1990; Hale & Keyser 1986, 1986, 1988; di Sciullo & Williams 1987; Grimshaw & Mester 1988, to mention just a few).

In this chapter, we will, step by step, develop a theory, which tries to account for the differences between different types of causatives as shown in section 1 (ex 1-6).

First, we shall show how a prominence theory of theta and argument hierarchy can contribute to a better understanding of what semantics can tell us about syntax ordering of arguments (2.1). Then, we will undermine this theoretical approach by analyzing Nominals and passives (2.2), and further the derivation of adjectival passives (2.3). In section 2.4., we will give some evidence showing that some unaccusatives participate and some do not participate in CAL. We will reject the theory of Pustejovsky and Busa (1995) and Pustejovsky (1996) on causation who argue that a description of the behavior of unaccusatives in terms of fixed classes does not capture the relatedness between the constructions involved in the diathesis alternation or in the unaccusative/unergative alternation for the same predicate (cf. Pustejovsky 1996:188). We will demonstrate that causatives and unaccusatives are not transforms of each other. Moreover, some psych agentive or non-agentive causatives do not participate in CAL. We shall reject the theory of Pustejovsky's regarding the description and explanation of Causation and Unaccusativity (Pustejovsky 1996:188passim). A short summary (3.) concludes this paper.

In her very influential book Jane Grimshaw (1990) develops a very insightful theory of representation of argument structure (a-structure). The term refers "to the lexical representation of grammatical information about a predicate." (Grimshaw 1990:1).

We want to take this theory as a possible basis of our own theoretical approach. As opposed to former approaches (Marantz' DM in 1984 or Levin and Rappaport 1986, 1988, 1995), Grimshaw's *prominence theory* of a-structure contrasts in a number of respects with the view

that a-structures are sets. The fundamental assumption is that the a-structure of a predicate has its own internal structure, which affects the grammatical behavior of the predicate in many ways. Also, “(the) organization of the a-structure for a predicate is taken to be a reflection of its lexical semantics...” (Grimshaw, op.cit.:3). As a consequence of such a theory, a-structure cannot be freely altered by rules, since “an argument has whatever a-structure properties it has by virtue of its role in the lexical meaning of the predicate and not by stipulation.” (op.cit.) As a consequence of all this, this *prominence theory* of a-structure is superior to any theory because it can both explain the syntactic variability and the acquisition of language (along the theory of Landau and Gleitman 1985 or Pinker 1989).

Let us recall the main points which would explain the structure of the above mentioned classes of verbs:

- (56) (i) ✓ agentive (murder, assassinate, cut),
- (ii) ✓ internally caused (blossom, wilt, grow),
- (iii) ✓ externally caused (destroy, kill, slay)
- (iv) ✓cause unspecified (break, open, melt).

Early work on thematic relations suggested the existence of a thematic hierarchy (Jackendoff 1982:43). My proposal is – following Grimshaw (1990:7) – that this hierarchy is properly understood as the organizing principle of a-structures because a-structure is constructed in accordance with the thematic hierarchy, so that the structural organization of the argument array is determined by universal principles based on semantic properties of the arguments. I will assume a version of thematic hierarchy in which the agent is always the most salient and thus highest argument. Next ranked is Experiencer, then Goal/Source/Location, and, finally, Theme, a scheme that is represented under (57):

- (57) (Agent (Experiencer (Goal/Source/Location (Theme)))) (Grimshaw 1990:8)

For an agentive verb like *murder*, the a-structure prominence relation are those given in (58)

- (58) *murder* (x (y))
 Agent Theme

The a-structure in (58) is not surprising because in agentive clauses the most syntactically prominent argument in Nominative-Accusative languages is the subject. However, this is not always the case. Suppose we apply this principles to construction of the type (55) we have introduced in section 1, here repeated as (59)

- (59) [(55)] Tento román se *mi* ***dobře čte***
 This novel_{Nom} Refl to me Cl_{Dat} well reads
 “I like to read this novel”

Albeit the fact that the transitive verb *číst* ‘to read’ is a verb which usually takes as external argument an agent, here the subject is a theme in nominative, and the next prominent argument in the hierarchy, an experiencer, takes the lowest argument position, so we get (60):

- (60) (x (y (z)))

Theme Exp ?

In addition, the sentence (55/59) would not be grammatical without the adverb *dobře*, 'well'.

- (61) *Tento román se *mi* ____ *čte*

The syntactic theory which postulates that all adverbs are just syntactic adjuncts and thus completely outside the domain in which a-structure regulates occurrence, can easily explain facts like passives but not sentences with modifying adverbs. Moreover, the adjunct analysis of *by*-phrases does correctly predict why the syntactic tests for Passives apply but not for Anti-Causatives (cf. section 1), cf.:

- (62) a. The wind was broken by the wind/boys/balls.
b. *Windows break easily by the wind/boys/balls.
c. *The window broke by the wind/boys/balls. (ex. from Grimshaw, 1990:143)

If *by*-phrases are a-adjuncts, the ill-formedness of (62b/c) follows, since the a-adjunct are unlicensed. Neither the middle form nor the inchoative form of the verb *break* has a suppressed argument to license the *by* phrase. Contrary to this, since passives are derived by the suppression of the external argument (B/J/R 1989, Grimshaw, op.cit.:143), which still is syntactically active, the *by* phrase (a-adjunct) is licensed.

In fact, if *by*-phrases were real adjuncts, it would not be clear why they cannot occur even with active verbs. In standard MGG approaches, no theta-criterion violation would result, by definition, since the theta-criterion regulates arguments, not adjuncts.

For purposes of transparency and exposure, I shall introduce the notion 'external arguments' and 'a-structure prominence' from Grimshaw (1990:33passim).

The notion of maximal prominence makes the notion 'external argument' from MGG approaches less clear: if we, alongside with Williams (1981), understand an external argument as the argument that is realized outside the maximal projection of the predicate:

- (63) arrest (x, y) or (Agent, Theme),

we cannot classify the causative verbs as we should.

For purposes of the present classification of causative and anti-causative verbs, the distinction between external and internal arguments being assigned a theta role Causer is far from being clear. Let us add some arguments in favor of a theory in which Theta-roles are assigned to their a-structure in a more explicit way.

2.3 Nominals and passives

A generally and widely accepted distinction has been made between arguments and adjuncts. Arguments can be selected and subcategorized, in the sense that they are under control of individual predicates, they must be licensed, they can only occur after they have been theta-marked by a predicate as a function of the predicate's argument structure (cf. Grimshaw 1990:108). Adjuncts, quite on contrary, are never theta-marked and do not to be under control of a verb or to be licensed by a relationship to the predicates a-structure. Their licensing

conditions seem to be fed by extensional relations of situations of possible worlds as I have already tried to speculate on in footnote 4. Adjuncts are not subcategorized by the intensional or a-structure of the predicate, hence their form is free, and they are never required by a-structure.

The general question of the relationship between nouns and verbs has occupied a central place in theoretical investigation ever since Chomsky's important investigation (Chomsky 1970). We know by then, that similarly to verbs, nouns can and do have obligatory arguments. This important property of nouns has been obscured by the fact that many nouns are ambiguous between an interpretation in which they do take arguments obligatorily and other interpretations in which they do not (cf. Grimshaw 1990:45passim for English and Babby 2002).

In Causative constructions of the transitive (psych-verb) *frighten* type of verbs, nominalization leads to an ambiguity in a change of the event structure and it enables a by-phrase. Usually, a verb, which expresses an event, has an additional meaning of process and it takes a by-phrase like in passives:

- (64) a. Ты меня напугал (Causative)
 b. Ty jsi mě polekal.
 c. Du hast mich erschreckt
 d. You scared me
 e. Przestraszyles mnie Zostalem prestraszony przez ciebie

- (65) a. Moe ispuganie *toboj*
 b. Mé vyděšení/ polekání *tebou*
 c. Das Erschrecken von mir *durch dich*
 d. The scaring of me *by you*
 e. Mój strach

Contrary to this, an Anti-Causative construction of the *fear*-class of verbs, nominalization is excluded with or without a by-phrase:

- (66) a. Já jsem se tě polekal (Anti-Causative)
 b. Ich erschrack vor dir
 c. I was startled by you

- (67) a. *Mé vyděšení/ polekání se (tebou / tebe)
 b. *Das Erschrecken von mir durch dich
 c. *The starteling of me by you

Derived nominals thus seem to confirm the hypothesis that Anti-Causatives are not licensed by a *by*-phrase because they do not have an external argument. Nevertheless, it seems to be the case that causatives proper share all other properties with all other transitive verbs. In the

representation prominence theory developed by Grimshaw (1990), nominalization resembles passivization in that it is the external argument of the base verb which is suppressed in both cases. Thus, NP-movement (Passives) and Causatives share the two properties stipulated in Chomsky (1981:103) and repeated here for convenience and expository reasons:

- (68) faire [manger la pomme par Pierre]
 (“to have the apple be eaten by Pierre”) (Chomsky 1981:103, ex. (6))

As Kayne (1975) observes, the embedded phrase has the properties of passive constructions. As in passives, no subject appears at D- or S-structure. The example (64) differs from similar constructions (i.e. passives, PK) in that it lacks passive morphology and there is no movement. Like in real passives (derived by movement), causatives of the type (6a/c/e) allow for by-phrases even in nominalisations. It follows, that neither anti-causatives nor causatives in which the causativisation is not caused by an external argument, cannot be nominalized nor passivized with by-phrases: this prediction is born out, cf:

- | | |
|---|----|
| <p>(69) a. Dívce spadla sklenice na zem.
 the girl_{Dat} fell a glass_{Nom} on the floor_{Acc}</p> <p>b. Spadnutí sklenice na zem (*dívky/ *dívkou_{Instr})</p> | Cz |
| <p>(70) a. U devushki upal na pol stakan.
 at girl.Gen fell on floor.Acc glass.Nom</p> <p>b. Padenie stakana (*u devushki/ *devushkoj) na pol</p> | Ru |
| <p>(71) a. Szklanka wypadła dziewczynie na ziemię Pl
 b. Wypadek szklanki (*przez dziewczynę/*dziewczynkę) na ziem Pl</p> | Pl |
| <p>(72) a. Alla bambina è caduto il bicchiere per terra.
 b. Il cadere a/per terra del bicchiere (*alla bambina, *da bambina). It</p> | It |
| <p>(73) a. Le verre de la fille a tombé par la terre
 b. La chute du verre (*de la fille/*par la fille) sur la terre</p> | F |

As we can see, the nominalization of an anti-causative verb only leads to ungrammaticality if the Possessive Phrase or the by-phrase is expressed. As noun it can only mean a state or result.

Possessives NPs in nominals like *the scaring of me (by you)* or the *enemy's destruction* of the city and by phrases of passives like *I have been scared by you* or *The city was destroyed by the enemy*. In both cases, the possessive NP and the by phrase can be suppressed on nominalisations and passives. So they cannot be part of the a-structure. For example, a possessive can never be given the theta-role of the subject of the corresponding verb, because this theta-role cannot be assigned by the Noun. The same reasoning holds for passive argument structures. The subject argument of the active verb is suppressed for the passive, similar for nominals. Cf.:

- (74) a. The enemy destroyed the city
 destroy (x (y))
 Agent Theme
 b. The enemy's destruction of the city

- destruction (R (x-⊖ (y)))
 Agent Theme
- c. The city was destroyed by the enemy.
 Destroyed (x-⊖ (y))
 Agent Theme
 (Grimshaw 1990:108)

For the *destroy/break* class the argument in the subject position of the active sentence is more prominent than the object along both dimensions, and also the the a-structure and the thematic hierarchy are parallel.

- (75) a. The enemy destroyed the city
 b. destroy (x (y))
 Agent Patient
 Cause

For the *frighten* verbs, however, the first position in the thematic organization does not correspond to the first position in the cause dimension, since they are not occupied by the same semantic argument. Instead, the second element in the thematic dimension is associated with the first element in the causal dimension, and the first element in the thematic dimension corresponds to the second position in the causal dimension;

- (76) a. The building frightened the tourists.
 b. frighten (x (y))
 Exp Theme
 Cause ...

In this respect, non-agentive causatives of the *frighten* class seem to have its source of asymmetry between a-structure and thematic structure in a conflict of two hierarchies, the subject being most prominent in the causal hierarchy but not in the thematic hierarchy.

This observation is confirmed and strengthened by examples of compounding which seem to violate the prominence theory. The ungrammaticality of examples like (77a) and (77b) are accounted for exactly because of an asymmetry between a-structure and thematic structure of these compounds which prevents the arguments of the compounds to be assigned the proper theta-role to its arguments:

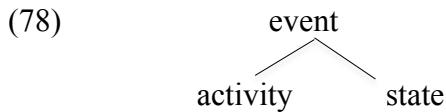
- (77) a. *A child-frightening storm
 b. * A storm-frightening child

(77a) is ungrammatical because it requires the Theme to be theta-marked in a wider domain than the Experiencer, and (77b) is impossible because it requires the non-Case to be theta-marked in a wider domain than the Cause. Since there is no way how to theta-mark without violating one or the other of the two sets or levels of prominence relations, there is no well-formed compound corresponding to non-agentive *frighten*.

The correlation and symmetry of two levels of prominence relations vs. their misalignment can be demonstrated on two classes of verbs: the *frighten* class vs. agentive predicates like the *break* causative. Only the latter has a nearly perfect alignment of the two dimensions: a-

structure and theta hierarchy, because they coincide. The same coincidence can be observed in the class of agentive verbs like arrest or unergative verbs like work. But also the fear class seems to behave like the agentive predicates (cf. ex. 49 vs. 50). As Grimshaw assumes, the notion of cause cannot be the only reason for these difference, since verbs like arrest, work, and fear are not causatives (Grimshaw, op.cit.: 26). The proposal of Grimshaw is that there is another dimension which determines the event structure of the predicates. I assume that each verb has associated with it an event structure, which when combined with elements in the clause, provides an event structure for the entire sentence. The event structure represents the aspectual analysis of the clause, and determines such things as which adjuncts are admissible, what the scope of elements like *almost*, *often*, *always* or *just* will be, and even which modals and quantifiers can be added (cf. Vendler 1967, Dowty 1979, Bach 1986, Pustejovsky 1988, Tenny 1988, 1989a, 1989c, Grimshaw 1990).

The event structure breaks down events into aspectual subparts. For example, a Vendler-Dowty ‘accomplishment’ denotes a complex event (which consists of an activity) and a resulting state (cf. Pustejovsky 1988 for a discussion):



An accomplishment like *x constructs y* Grimshaw (1990:26) analyzes as an activity in which *x* engages in construction plus a resulting state in which existence is predicated of *y*. For *x breaks y*, the activity is one in which *x* engages in breaking, and the resulting state is one in which *y* is broken.

Now a cause argument has a standard representation in such an analysis: it will always be associated with the first sub-event, which is causally related to the second sub-event. Thus we have a generalization which concerns the causativity: here the first sub-event entails the cause as its most prominent argument, be it explicit or implicit and the second sub-event determines the argument corresponding to the element whose state is changed. Compare ist now with the four classes which take part in the one way or other in causativity:

- (79) (i) ✓ agentive (murder, assassinate, cut),
(ii) ✓ internally caused (blossom, wilt, grow),
(iii) ✓ externally caused (destroy, kill, slay)
(iv) ✓ cause unspecified (break, open, melt).

For agentive predicates of the first group, the Agent will be the aspectually most prominent argument for all aspectual classes of verbs. Since ist is also thematically most prominent, the subject of an gentive verb like *cut* is most prominent according to the aspectual and thematic hierarchy:

- (80) Transitive agentive
(Agent (Theme))
1 2

In case of ditransitive verbs of the type to *give* I have no particular evidence on the aspectual status of the Goal and Theme, thus I will indicate their ranking with an x).

- (81) Ditransitives
 (Agent (Goal (Theme)))
 1 x x

If ditransitives show up in a causative context, it has been demonstrated that Causative Alternation parallels between three-figure (triadic) verbs and transitive CC (den Dikken 1995:239; see also Kosta 2011:276).

In the theory designed here, nominalization resembles passivization in that the external argument of the base verb is suppressed in both cases. The failure of the passives of the *frighten* class follows from the fact that verbs in this class have no external argument.

Belletti and Rizzi (1988) demonstrate that Italian psych verbs of the preoccupare ‘to worry’ class have no corresponding verbal passive, although they do allow the adjectival passive. The present theory predicts exactly the same for the *frighten* class in English, Czech, German and Russian, in which the non-agentive *frighten* has the a-structure of (82), and verbal passivization should be excluded. This prediction is born out:

- (82) a. Já jsem se tě polekal
 b. Ich erschrak vor dir
 c. I was startled by you
- a. *Byl jsem tě polekán tebou
 b. *Ich wurde vor dir erschrocken durch dich
 c. ?I have been startled by you

2.3 The derivation of adjectival passives

Verbal Passive can suppress only an external argument, but to derive (82’), an internal argument (the Theme) would have to be suppressed instead. Thus *frightened* cannot be a verbal passive. The prediction is then, that all passive forms like *frightened* here must be adjectival passives, and the evidence supports this prediction. They constantly pass all the tests for adjectivehood with flying colors. They allow negative un-prefixation, they occur as complements to the verbs that select Aps (e.g. *remain*, etc.) and they are relatively unfussy about prepositions: *frightened* can occur with about, by, or at. Unlike Pesetsky (1987) I do not assume that a by phrase indicates a verbal passive, since it can co-occur with unambiguously adjectival properties:

- (83) a. Fred remains completely unperturbed by his student’s behavior.
 b. Fred zůstává naprosto nedotknuty chováním svého studenta.
 c. Фред остается полностью невозмутимым поведением своего ученика.
 d. Fred pozostaje całkowicie niewzruszony zachowaniem swojego ucznia.

The second evidence to differentiate between verbal passives and adjectival passives is that only the first allow a progressive form which is incompatible with stative predicates, and English adjectives derived from verbs are by and large states (similarly to nominalizations):

Thus, a verb like *depress* can be used with the progressive form only in the active and psychological causative form, but in the passive (which is an adjective state), it is ungrammatical. In Czech, there is no progressive form so this test is not possible.

- (84) a. The situation was depressing Mary.
- b. *Mary was being depressed by the situation.
- c. *Mary was being depressed about the situation.
- d. Situace deprimovala Marii.
- e. Marie je deprimovaná situací (adjectival passive = longform Adjective)
- f. Marie byla deprimována situací (verbal passive, PPP)

With an agentive psychological verb like *terrify* the paradigm changes in the expected way, and the progressive form is fully grammatical with by:

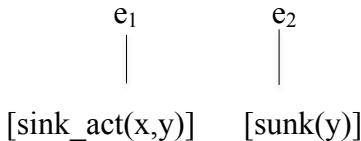
- (85) a. The government is terrifying people.
- b. People are being terrified by the government.
- c. Vláda děsí lidi.
- d. Lidé jsou vládou *zdešení*. (adjectival passive = longform Adjective)
- e. Lidé jsou *zdešeni* vládou.

2.4 Three levels of representation: a-structure, thematic structure and event semantics

As we have already seen, a classification of causatives fails if one tries to postulate a direct link between causativity and unaccusativity. Neither is the class of unaccusatives identical with, nor is it a subset of the much bigger class of causatives.

The work of Van Valin (1990), Zaenen (1993), Pustejovsky (1996:188), and others has illustrated the problem in failing to link “unaccusativity” to the lexical semantics. Pustejovsky and Busa (1995) argue that a description of the behavior of unaccusatives in terms of fixed classes does not capture the relatedness between the constructions involved in the diathesis alternation or in the unaccusative/unergative alternation for the same predicate (cf. Pustejovsky 1996:188). Pustejovsky (1996, section 9.2, 188passim) cites Chierchia (1989) who suggests that the lexical representation for unaccusatives is in fact an underlying causative. What we want to show is that causatives and unaccusatives are not transforms of each other, and that some psych agentive or non-agentive causatives do not participate in CAL. Moreover, we can also reject the theory of Pustejovsky's regarding the description and explanation of Causation and Unaccusativity (Pustejovsky 1996:188passim). Pustejovsky combines Causation and Unaccusativity with the concept of underspecified event structure and argues that those unaccusatives which also have causative counterparts are logically polysemous because of the headless nature of the event structure representation of the predicate. For the Italian verb *affondare* ‘to sink’ he postulates the following unheaded event tree structure below under (86):

- (86) $e_{<a}$
-



- (87) a. I nemici hanno affondato la nave,
 “*The enemy sank the boat*”
 b. La nave è affondata.
 “*The boat sank*”

Compare this structure to a lexically right-headed predicates such as *arrivare* (arrive) and *morire* (die), which have only unaccusative realizations, as demonstrated in the sentences (88) and (89):

- (88) a. Il pacchetto è arrivato.
 “*The package arrived.*”
 b. *Il postino ha arrivato il pacchetto.
 “*The mailman arrived the package.*”
 c. *Il postino ha fatto arrivare il pacchetto.
 (Pustejovsky 1996:190)

The last example marked as ungrammatical in Pustejovsky (1996:190) is absolutely perfect.

More important is the fact, that the unaccusative verb *arrivare* can, but need not, express the location argument, *y*, as a default argument. The fact that sometimes this argument is semantically obligatory and sometimes not (in syntax it can always be obviated) is explained and dictated by the effect that headedness has on argument expression. In Pustejovsky’s theory (1996:191), “only arguments associated with the headed event are obligatory expressed at surface structure”, whereas headless events, along with their arguments, are shadowed, resulting in an interpretation with quantificational closure over these arguments. For a lexically-determined unaccusative such as *arrivare*, the mapping is unambiguous, and there is but one syntactic realization possible, namely expression of the “deep object” argument as the subject in an intransitive structure. In Grimshaw (1990) the obligatoriness of the deep object argument in unaccusatives of this class is explained and motivated by the theory of thematic prominence (89)

- (89) (Agent (Experiencer (Goal/Source/Location (Theme)))) (Grimshaw 1990:8)

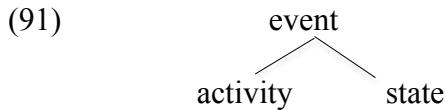
Since intransitives have only one argument which is linked to the a-structure, the theta-criterion is satisfied when the unique argument gets assigned the most prominent theta-role Theme. It follows that the PP *a casa* ‘at home’ is an adjunct which is not linked to the a-structure, but is in fact adding specificity to the relation in the event associated with the theme. For the same reason, although a direct causative construction is not possible for *morire* (die) (but possible for *arrivare*), reference to the initial subevent in the event structure is still possible with certain adjunct phrases, as shown in (90):

- (90) a. Gianni è morto per una pomonite.
 “*John died from pneumonia.*”

- b. Il tetto è crollato per il peso della neve.
“The roof collapsed from the weight of the snow.”
- c. Maria è arrossita per l’imbarazzo.
“Mary blushed out of embarrassment.”
- d. Gianno è annegato per il maltempo.
“John drowned from bad weather.” (Pustejovsky 1996:191passim)

Only if we differentiate between (a) a-structure which displays the number, ordering and kind of arguments of the predicate (external vs. internal, suppressed or explicit), (b) the thematic structure which gives the prominence of theta-roles (cf. 57) of each predicate, and (c) event structure (state, change-of-state, agentive, accomplishments or achievements, inchoatives etc.), we can predict to which classes of verbs the feature of causation [\pm caus] applies.

The typical case of agentive verbs



An accomplishment like *x constructs y* Grimshaw (1990:26) analyzes as an activity in which *x* engages in construction plus a resulting state in which existence is predicated of *y*. For *x* breaks *y*, the activity is one in which *x* engages in breaking, and the resulting state is one in which *y* is broken.

Now a cause argument has a standard representation in such an analysis: it will always be associated with the first sub-event, which is causally related to the second sub-event. Thus we have a generalization which concerns the causativity: here the first sub-event entails the cause as its most prominent argument, be it explicit or implicit and the second sub-event determines the argument corresponding to the element whose state is changed. Compare ist now with the four classes which take part in the one way or other in causativity:

- (92) (i) ✓ agentive (murder, assassinate, cut),
(ii) ✓ internally caused (blossom, wilt, grow),
(iii) ✓ externally caused (destroy, kill, slay)
(iv) ✓cause unspecified (break, open, melt).

For agentive predicates of the first group, the Agent will be the aspectually most prominent argument for all aspectual classes of verbs. Since ist is also thematically most prominent, the subject of an gentive verb like *cut* is most prominent according to the aspectual and thematic hierarchy:

- (93) Transitive agentive
(Agent (Theme))
1 2

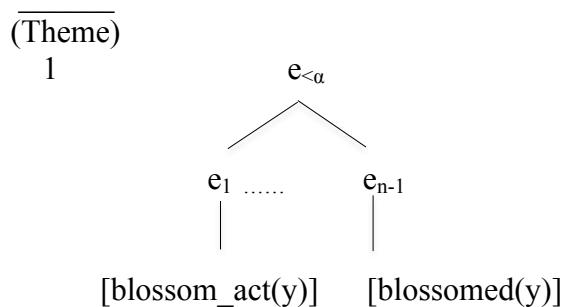
In case of ditransitive verbs of the type to *give* I have no particular evidence on the aspectual status of the Goal and Theme, thus I will indicate their ranking with an x).

- (94) Ditransitives
 (Agent (Goal (Theme)))
 1 x x

If ditransitives show up in a causative context, it has been demonstrated that Causative Alternation parallels between three-figure (triadic) verbs and transitive CC (den Dikken 1995:239; see also Kosta 2011:276).

The verb class (iii) *blossom, wilt, grow* are typically inchoatives, where the external argument is a theme and the event structure can be divided into sub-events with a finite state (e_1, e_2, \dots, e_{n-1}) which – similar to accomplishments (Vendler 1967) – approach an endpoint incrementally.

- (95) Unaccusatives / Anti-Causatives (*blossom, wilt, grow*)



The incremental event structure prevents the event ‘to blossom’ to be limited to a certain time span:

- (96) *The flower blossomed two hours
 *The flowers blossomed in two hours

Still, the event can become a part of a quantification structure introduced by a generic operator where a more abstract time span allows for an incremental event structure:

- (97) Flowers blossom from spring to summer

We believe that different event structure of those verbs is also the reason why we cannot mix them up or confuse with the class (iv) *break, open and melt*. Verbs of the class (iii) belong to the class of achievements because the event structure, change of state, takes place: Recall that achievements and accomplishments are distinguished from one another in that achievements take place immediately (such as in “recognize” or “find”) whereas accomplishments approach an endpoint incrementally (as in “paint a picture” or “build a house”). For the same reason, as opposed to class (iii), the predicates of class (iv) *melt, break and open* license a time limit on

the event structure:

- (98) a. The ice melts in 2 minutes
 b. The glass breaks when exposed to high heat in a few / after a few seconds.
 c. The door opened in two seconds

What about psych verbs of the *frighten* and *fear* class, and what about the difference between unergatives and unaccusatives w.r.t. the event structure? (99) and (101) have a base generated external argument subject (Experiencer, Patient and Causer), whereas the subject of (100) and (102) are in fact derived objects (theme and experiencer).

- (99) a. Пловец утонул (unergatives)

- b. Plavec **se** utopil
- c. Der Schwimmer ertrank
- d. The swimmer drowned

- (100) a. Лодка **затонула** (unaccusatives)

- b. Lod' **se** potopila
- c. Das Boot sank
- d. The boat sank

- (101) a. Ты меня напугал (Causative)

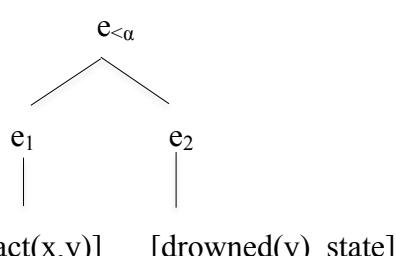
- b. Ty jsi mě polekal.
- c. Du hast mich erschreckt
- d. You scared me

- (102) a. Já jsem se tě polekal (Anti-Causative)

- b. Ich erschrack vor dir
- c. I was startled by you

The event structure of *drown* and *sink* verbs is not identical. The *drown* class can be subdivided into two sub-events: activity (process of a certain duration the experiencer or patient are exposed to) and a result (state) in which the Experiencer is exposed to a certain time span of fighting against his fate:

- (103)



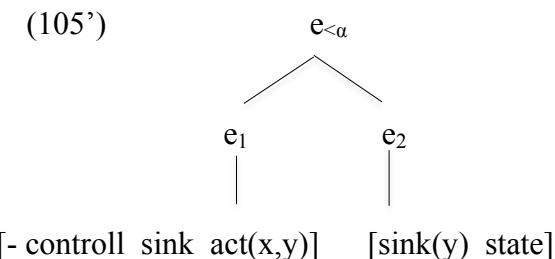
- (104) a. Пловец тонул 5 минут (unergatives)

- b. Plavec **se** topil 5 minut (a pak **se** utopil)

- c. Der Schwimmer ertrank nach fünf Minuten
- d. The swimmer drowned in 5 minutes

In case of inanimate objects (like the *boat*) there is not such a possibility to control the event 1 – contrary to what Pustejovsky (1996) assumes – because the resultative of the verb *affondare* cannot pass the test of durative verbs (process) but only the test of achievement verbs (Vendler 1967):

- (105) a. La nave è affondata in/dopo cinque minuti / * per cinque minuti
 b. Корабль затонул в течение двух минут /*Корабль затонул две минуты
 c. Lod' se potopila za dvě minuty / * dvě minuty
 d. Das Boot sank nach/in zwei Minuten / *zwei Minuten lang
 e. The boat sank in two minutes /* two minutes



Contrary to (105) which excludes states and resultatives from a durative interpretation, the durative progressive form *stava affondando* can be modified with aspectual adverbs of duration such as già ‘already’.

- (106) a. La nave stava affondando già da due ore
 ‘The boat was sinking already for two hours’
 b. * Корабль затонул всего 2 минуты
 c. * Lod' tonula dvě minuty.
 d. ??lodka tonula uzhe dva chasa

In Russian and Czech the perfective Verb has only the resultative interpretation and the imperfective (durative) partner is subcategorized for the *drown* class with an animate and human agent. The major reason for this restrictions lies in the semantics of the verb *to sink* which is anti-causative with a one-place event structure (without head) and a sole argument with the theta-role <Theme> which has no control over the resultative state of sinking.

The subdivision of the event structure into two parts (similar to the sink class) is not possible in case of the anti-causative *fear* class (50) because these verbs allow only a one-time, instantaneous, resultative interpretation as an event in the strict sense.

2.5 Putting the pieces together

We believe that semantics in language can only be intensional and based on LFG or on a type of Categorial grammar like in Montague grammars. As linguistics is about our linguistic knowledge (competence) and how the Generator computes the linguistically relevant information from the interfaces, the semantic and syntactic information must be somehow combined and ‘encoded’.

It is not interpretation and intention but events and their intensional encoding in syntax which counts. My idea is the following.

The LEXICON consists of underspecified ROOTS as input to lexical and functional categories.

Lexical categories such as verbs, nouns, adjectives, prepositions ... contain morpho-syntactic information about a-structure and thematic prominence, as well as some kind of abstract ‘event’ semantics.

Functional categories such as light v, Caus, Voice, Event (e), Det contain purely formal features.

SYNTAX computes lexical heads from the lexical array and combines them with functional heads vP, DP.....

1) Level of Syntax:

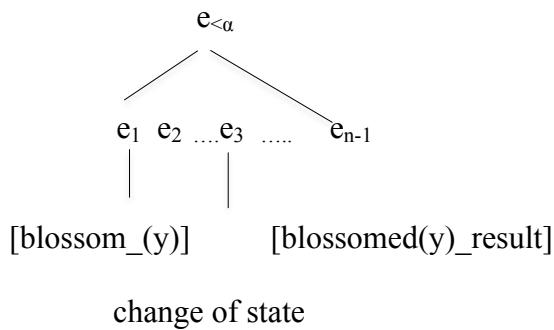
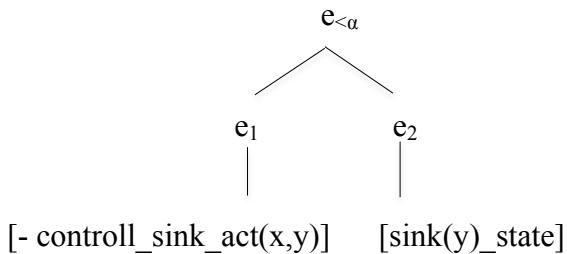
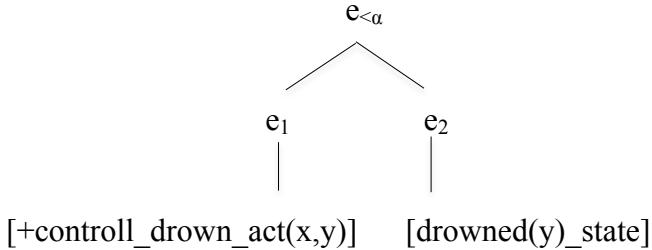
- \root \open ----> a) dominated by a VP ----> door opened (Anti-Causative/Unaccusative/Middle)
\root \open-----> b) dominated by a vP ----> Peter opened the door (Transitive)
\root \open ----> c) dominated by a DP ---> the opening
\root \open ----> d) dominated by a VoiceP ---> the door has been opened (by Peter)
root \open ----> e) dominated by a Caus ----> Peter made Paul open the door

- 2) Level of a-structure a) _____ VP (y)
 b) (x)____vP__(y)
 c) _____ DP (V)
 d) (y)___VoiceP_(by_x)
 e) (x)___CausP_(z)_VP (y)

3) Level of thematic prominence:

- a) (Patient (Thema (Instr (....))))
b) (Agens (Experiencer (Source/Goal (Thema))))
c) (Thema (Effect (.....)))
d) (Thema (Agent))
e) (Causer (Causee (Thema)))

4) Level of event structure:



We believe that these four levels are all informations that – in a strict logic predicate account – must be bound by Lambda-Operator at the *Semantic Form* so they can operate and be cognitively computed by the brain in a most parsimonial manner. The four levels of computation of semantic and syntactic information of a sentence have only one single Spell-Out⁹.

⁹ I am deeply indebted to an anonymous reviewer who also suggested that a four level approach does not really respect the fact that information has to be parsed and computed in a very discrete simultaneous way. But this is of course not a model of grammar that aims to explain how grammar is parsed in brain. His proposal is to subsume levels (a), (b), (c) and (d) to an “enriched Logical Form, which, on the one hand, incorporates a form of Montague Grammar, and, on the other, reads local relations between arguments and predicates as theta roles (e.g., compl-V as Theme, and so on). If one can do that, then you have only two levels: Syntax and LF. Now, is there anything in the syntax that is absent at LF? If there is, the system would be entropic, that is, it would lose information. My intuition as a physically driven guy is that information, if represented in the brain, is electricity between neurotransmitters that is, energy. And energy cannot be destroyed, just transformed (saying that information has neurological basis is pure biolinguistics, is it not?): therefore, if two levels lead us to lose information, we have to get rid of one. And, if the information is the same, we can as well dispense with one level (the same reason why S-structure was abandoned, or, at least, one of the reasons: S-structure was D-structure plus traces, but the information was the same). My ultimate point is that while your levels can be distinguished with explanatory purposes, they can all be subsumed to an enriched Logical Form in a free syntax,

3. Conclusion

In the present paper, we have tried to advocate a theoretical position in which the derivation of syntactic structure obeys two independent, but closely aligned principles: *the principle of a-structure hierarchy and the principle of prominence theory of thematic ordering*.

Grimshaw's *prominence theory* of a-structure contrasts in a number of respects with the view that a-structures are sets. The fundamental assumption is that the a-structure of a predicate has its own internal structure, which affects the grammatical behavior of the predicate in many ways.

Our study has shown the way in which the event structure of the four classes of verbs can influence the interpretation and analysis of the sentence structure and the thematic prominence of the sentence. The inability of verbs of the *fear* class to subdivide events in individual events is closely related to their a-structure. Since these verbs don't have a tier to the event structure, which expresses activity by controlling argument and the theta role of these verbs can contain *no agent*, the Causativity cannot be expressed explicitly. Thus, explicit Causativity has always an alignment between event structure, a-structure, theta-roles and the causative feature itself. Is the causative feature aligned to the external argument Agent, the syntax projects Causative constructions of the transitive (psych-verb) *frighten* class of verbs, and nominalization leads to an ambiguity in a change of the event structure and it enables also a by-phrase in passives. Usually, a verb, which expresses an event, has an additional meaning of process and it takes a by-phrase like in passives. Furthermore, a clear evidence comes from *adjectival passives* which as opposed to verbal passives are *states*. In this paper we have also discussed how certain types of arguments can be treated in causatives and anti-causatives w.r.t. case assignment and argumenthood. As we can see, the nominalization of an anti-causative verb only leads to ungrammaticality if the Possessive Phrase or the by-phrase is expressed. As noun it can only mean a state or result. Possessives NPs in nominals like *the scaring of me (by you)* or the *enemy's destruction* of the city and by phrases of passives like *I have been scared by you* or *The city was destroyed by the enemy*. In both cases, the possessive NP and the by phrase can be suppressed on nominalisations and passives. So they cannot be part of the a-structure. For example, a possessive can never be given the theta-role of the subject of the corresponding verb, because this theta-role cannot be assigned by the Noun. The same reasoning holds for passive argument structures. The subject argument of the active verb is suppressed for the passive, similar for nominals.

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thus getting a single level (LF) and a simple generative procedure (Merge), which combines arguments and predicates in order to generate semantically legible structures. This is my humble opinion...I hope it serves you of something.” (an anonymous reviewer, p.c.).

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