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An account for Change of State verbs cross-linguistically

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Change of State Verbs – Empirical and Theoretical Perspectives (AG4)

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Roadmap

- Data
- Aims
- Introduction
- Analysis
- Conclusions

Data

- CoS verbs express a change on an attribute of one of the verb's argument, i.e. the referent of the theme

- They are classified as result verbs; result verbs express a scalar change

(Rappaport Hovav & Levin 2010)

- They take agents as external arguments, they have a use that lack an external argument syntactically and semantically

(Levin & Rappaport Hovav 1995; Reinhart 2002; Schäfer 2009)

(1) a. John opens the door. (transitive/causative CoS)
b. The door opens. (intransitive CoS/ inchoative /anticausative)

- CoS verbs do not behave uniformly with respect to telicity
  - There are 'pure' or 'strictly' telic CoS verbs (*open*, *close*) and atelic (*grow*)

Data

- 'Pure' or 'strictly' telic CoS verbs (*open, close*) participate in the causative / inchoative / anticausative alternation, i.e. in both uses they express a change of state without specifying how this change of state comes about (*open* vs *cut:* it involves a CoS but also notions of motion and contact)

  (Levin 1993: 9; see also McNally & Spalek 2022 for the hypothesis that typical transitive uses of *cut* entail only minimal scale in English, while in Spanish maximal scalar change) '

- A subclass of CoS verbs, Degree Achievements (DAs) like *cool, dry*, can be either telic or atelic, punctual (*explode, break*) or durative (*cool*). This contrast is reflected in their scales

  (Abusch, 1986; Dowty, 1979; Hay et al., 1999; Beavers 2008; 2013; Fleischhauer 2013, Sioupi 2012)

Data

Traditional syntactic analysis: intransitive CoS verbs (intrCoS) / inchoatives / anticausatives are unaccusatives:

(2) a. [TP … [VP $DP_{AGENT/CAUSER}$ [verb DP_{THEME}]]]
b. [TP … [VP verb DP_{THEME}]]

(e.g. Levin & Rappaport Hovav 1995; Reinhart 2002)

Traditional semantic analysis:

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

(e.g. Dowty 1979, Levin & Rappaport Hovav 1995)

Data - German

In German, CoS verbs undergoing the causative alternation can appear:

(i) as morphologically unmarked, known as *unmarked intransitives (intr)CoS / inchoatives / anticausatives,* i.e. neither the causative nor the inchoative/anticausative use is explicitly marked (see 4a,b):

(4) a. Hans schmilzt die Butter. (causative)
Hans melts the butter$_{ACC}$
b. Die Butter schmilzt.
The butter$_{NOM}$ melts$_{3SG}$
(unmarked intrCoS/inchoative/anticausative)

(ii) as (reflexively) *marked intransitive (intr)CoS / inchoatives / anticausatives*, in case they appear with the reflexive pronoun 'sich' (see 5a,b).

(5) a. Hans öffnet die Tür. (causative)
Hans$_{NOM}$ opens$_{3SG}$ the door
b. Die Tür öffnet sich. (marked intrCoS / inchoative /
The door$_{NOM}$ opens$_{3SG}$ **REFL** anticausative)

(Schäfer 2008, Haspelmath 2019, inter alia)

Data - Greek

In Greek, unlike in Romance and in German, there is no reflexive pronoun. Instead, verbs appear with an non-active morphology, used for inherently reflexive constructions (6).

(6) I Maria htenise**te**. (inherently reflexive)
the Maria.$_{NOM}$ combs.$_{NACT.3SG}$
'Maria combs herself'.

(Schäfer 2008: 60, ex. 60b)

IntrCoS verbs/inchoatives/anticausatives in Greek can appear:

(i) with a morphological marking (7a):

(7) a. I supa kege**te**. (intrCoS/inchoative/anticausative)
the soup.$_{NOM}$ burns.$_{NACT.3SG}$
'The soup burns'.

(Schäfer 2008: 25, ex. 41b)

Data - Greek

(ii) without a morphological marking (7b):

b. I porta anikse. (intrCoS/inchative/anticausative)
the door$_{.NOM}$ opened$_{3SG}$
'The door opened'.

(iii) with an optional marking (7c,d):

c. To trapezomantilo lerose apo mono tou.
the tablecloth.$_{NOM}$ dirtied$_{3SG}$ by self it
d. To trapezomantilo lerothike apo mono tou.
the tablecloth.$_{NOM}$ dirtied.$_{NACT.3SG}$ by self it
(intrCoS/inchoative/anticausative)

(Schäfer 2008: 26, ex. 43b,c)

CoS verbs |GE, EN, GR

	Transitive CoS / causative	Unmarked intrCoS / inchoative / anticausative	Marked intrCoS / inchoative / anticausative
German	Act	Act	Refl
English	Act	Act	Act
Greek	Act	Act	Nact

Table 1. CoS verbs | GE, EN, GR

Goal of the talk

- To look in detail at how structure and meaning interact
- To propose a set of rules which relate syntactic and semantic information to each other
- To introduce an analysis of comparative concepts

Introduction

- Verbs have features that correspond to the valence information known from other theories (LFG, HPSG) (Müller 2013, 2016, 2018)
- Work on GB and Minimalism focuses primarily on syntax
- In Construction Grammar syntax and semantics are treated simultaneously (Goldberg 1995, 2006a) ee also HPSG, Pollard & Sag 1987, 1994, Sag 1997)

Introduction

- This talk starts with the observation that even within a class of semantically similar verbs like (in)trCoS verbs/ (anti-)causatives, these verbs differ with respect to the distribution of morphological (un)markedness

- It combines valency-based approaches and argument structure

(Herbst 1992, 2011)

- It offers a way to link the semantic (theta-) role assignment, to case marking, while the semantic decomposition formally describes the CoS verbs

(Dowty 1979)

The analysis

The proposed analysis is built on different levels.

(i) Argument structure (argument variables) level. It assumes that all lexical items come with a list that contain their arguments (see also Müller 2018:62)

(ii) Valency patterns level
- The analysis views valence alternations and argument structure as a primary means indentifying verb class alternations
- It outlines why valency theory and argument structure should be combined

(iii) Semantic (theta-) roles (the semantic relations between a verb and its arguments) are introduced at this level

(iv) Syntactic level (assuming the distinction between structural and lexical cases; case plays a more important role in German and Greek than in English)

(i) Grammatical functions (subject, object etc.) level

(ii) Semantic decomposition of the constructions (besides semantic (theta-) roles there is a meaning component in the verb))

(see also Goldberg 2006: 39-40)

Notes: 1. The phonological level is irrelevant
2. The analysis ignores temporal information

The analysis: trCoS / causative (GE)

(8) a. a. Hans schmilzt die Butter. (causative)
Hans melts the butter$_{ACC}$

(ex. 4a repeated as 8a)

(9)

(a) Argument variables SCHMELZEN (*MELT*) (x, y)
The argument structure is determinated by a lexicon entry

(Haider 1985:228)

(b) Valency [NP$_{NOM}$ NP$_{ACC}$]
- TrCoS / causative licence external arguments;
'schmelzen' (*melt*) is transitive, with an a-structure that contains two elements, i.e. one in nominative case and one complement in accusative case (Burzio 1981; Grewendorf 1989 inter alia)

(c) Semantic (theta-) roles: x: agent y: theme/patient

NPs in nominative case can have other theta-roles than *agent* (*the sun melts the butter*)

The analysis: trCoS / causative (GE)

(d) Case - ACC

- A structural case (in German nom. as assigned by [+finite] and acc. as assigned by the VP)

(e) Grammatical functions Sbj dObj

- The realization of arguments are linked with grammatical functions (subject, direct object, indirect object)
  (9e) are realized in different ways: by means of case suffixes in the case of Greek, configurationally in a language like English

The analysis: trCoS / causative (GE)

(f) Semantic Decomposition CAUSE (DO_{MELT} (x,y),BECOME(BE_{MELT}(y)))

- The distinction causative / anticausative has been formalized by means of different primitives such as CAUSE, DO, BECOME
- TrCoS / Causatives have two events (CAUSE, BECOME) and one result state (s. 9f SCHMELZEN‘ *MELT*)

(Hale & Keyser 1993, Rapp 1997, Ramchand 2008, Travis 2000)

- The trCoS / causatives are described via the predicate DO (see 7f).
- From (7f) we can infer that x is the agent of the overall situation and thus it controls the final result, too
- The predicate BECOME „[…] encodes change over some temporal span“

(Van Valin/LaPolla 1997: 104)

The analysis: trCoS / causative (GE)

(10) TrCoS / causative (‘schmelzen‘ *melt*) (GE)

(a) Argument variables	SCHMELZEN (*MELT*)(x, y))	
(b) Valency	[NP_{NOM}	NP_{ACC}]
(c) Semantic rolles	x: agent	y: theme
(d) Case	-	ACC
(e) Grammatical functions	Sbj	dObj
(f) Semantic Decomposition	CAUSE(DO_{MELT} (x,y), BECOME(BE_{MELTED}(y)))	

(Dowty 1979; Van Valin/La Polla 1997:102, 105)

The analysis: trCoS / causative (GR)

Greek trCoS / causatives behave simirarly to their German (and English) counterparts

(11) TrCoS / causative (‘anigo‘ *open*) (GR)

(a) Argument variables	ANIGO (*OPEN*)(x, y))	
(b) Valency	[NP_{NOM}	NP_{ACC}]
(c) Semantic rolles	x: agent	y: theme
(d) Case	-	ACC
(e) Grammatical functions	Sbj	dObj
(f) Semantic Decomposition	CAUSE(DO_{OPEN} (x,y), BECOME(BE_{OPENED}(y)))	

(Sioupi 2019)

The analysis: unmarked intrCoS / inchoative / anticausative (GE)

(4) b. Die Butter schmilzt.
The butter$_{NOM}$ melts$_{3SG}$ (ex. 4b repeated here)
They behave exactly the same as their English counterparts.

(12) **Unmarked intrCoS / inchoative /anticausative** (‘schmelzen ‘*melt*)

(a) Argument variables	SCHMELZEN (*MELT*)(x)
(b) Valency	[NP$_{NOM}$] (no thematic external argument)
(c) Theta role	x: theme
(d) Case	_

- Unaccusative verbs do not assign case; the direct object moves to the subject position, assigned the theta-role *theme* where it has the nominative case as the „subject“

(e) Grammatical function	Sbj
(f) Semantic decomposition	BECOME(BE$_{MELTED}$(y))

(Sioupi 2019)

The analysis: (reflexively) marked intrCoS / inchoative anticausative (GE)

(5) b. Die Tür öffnet sich.
The door$_{NP\text{-}i}$ opens$_{3SG}$ **REFL**$_{NP\text{-}i}$ (ex. 5b repeated)

(13) **(Reflexively) marked intrCoS / inchoatives / anticausatives** ('öffnen' *open*)

(a) Argument variables	ÖFFNEN (*OPEN*) (x)	
(b) Valency	[NP$_{NOM}$	NP$_{ACC}$]
(c) Theta- roles	x: theme	**sich: expletive**[1]
(d) Case	-	sich: ACC
(e) Grammatical functions	Sbj	

- They involve two case-marked DPs but only one theta-role
- The reflexive morphology is realized by an ordinary pronoun *sich*
- *sich* is a syntactic but not a semantic argument of the verb, has no theta-role, i.e. it is an expletive (see also Koontz-Gardoben 2009)
- They are syntactically transitive but semantically intransitive / unaccusative (Alexiadou et al. 2015: 102-105, Schäfer 2021)

1. (Cf. Schäfer 2008; Alexiadou et al. 2015; Wood 2014, 2015; Kastner 2016; Myler 2016; Wood & Marantz 2017)

The analysis: (reflexively) marked intrCoS / inchoatives anticausative (GE)

(13)

(f) Semantic decomposition $\quad$ $\text{BECOME}(\text{BE}_{\text{OPENED}}(y))$

(Rappaport Hovav & Levin 1998: 108; Alexiadou et al 2015: 105)
(s. also McNally 2011:1829-1830; Moro 1997; Bentley et al . 2013; McCloskey 2014, a.o.)

The analysis: (reflexively) marked intrCoS / inchoative anticausative (GE)

(14) **(reflexively) marked intrCoS / anticausative** (‘öffnen‘ *open*)

(a) Argument variables	ÖFFNEN (OPEN) (x)
(b) Valency	[NP_{NOM} NP_{ACC}]
(c) Theta- roles	x: theme **sich: expletive**
(d) Case	-
(e) Grammatical functions	Sbj
(f) Semantic decomposition	BECOME(BE_{OPENED}((y))

The analysis: marked intrCoS / inchoative / anticausative (GR)

(15) I supa kege**ete**.
the soup.$_{NOM}$ burns$_{.\mathbf{NACT}.3SG}$
'The soup burns'. (ex. 5a repeated as 15)

(16) **marked intrCoS / inchoatives / anticausatives** ('kegete' *burns*) (GR)

(a) Argument variables	KEGE**TE** (BURNS) (x)
(b) Valency	[NP$_{NOM}$]
(c) Theta- roles	x: theme
(d) Case	-
(e) Grammatical functions	Sbj
(f) Semantic decomposition	BECOME(BE$_{BURNT}$ (y))

The analysis: DAs (EN)

- DAs (*cool*, *dry*) depend on contextual parameters

- They are associated with a lexically specified scale and entail an incremental, directed measure of change along this scale. They can be either telic or atelic (ex. 17)

  (17) She warmed the solution in three minutes/for three minutes.

- The incremental change is an increase / decrease of the warmness

  (Abusch 1986, Dowty 1979, Hay et al. 1999, Kennedy 1997, McNally 2017, Sioupi 2012)

The analysis: DAs (EN)

Are CAUSE, BECOME appropriate for this purpose? (Williams 2015; McNally 2022)

- BECOME lacks the ability to express incremental changes

(Dowty 1979/1991)

- *Warm, cool* is analyzed as a dimensional adjective with negative polarity, temperature as the dimension of measurement (the scale associated with warm) consists of degrees of temperature

(Bierwisch 1989; Osswald 2015: 15)

(18) "**temp-stg** (x) denotes stages of x's having temperature d"

(Osswald 2015: 15)

(see also Beavers 2008; Beavers et al. 2022; Kennedy & McNally 2005; Schäfer 2021)

- Every bounded event has an attribute FIN(AL) whose value is the final stage of the respective event, i.e. the endpoint

(See also Kennedy & Levin 2008:174; McNally & Kennedy 2005; McNally 2017; Beavers et al. 2022; Solt 2022 for different scalar approaches)

The analysis: DAs (EN)

- The interpretation of DAs

(19) INIT (**temp-stg** ∧ TH .= x) ∧ FIN (**temp-stg** ∧ TH .= x) ∧ INIT TEMP >temp FIN TEMP

(Osswald 2015: 15, representation 12)

(see also Beavers 2008; Kennedy & McNally 2005; Schäfer 2021)

- where INIT(IAL) is the initial stage of a bounded event
- **temp-stg** (x,d) denotes stages of x's having temperature d
- **temp-stg**: a stage predicate to which the arguments x and d are bound by the functional relations TH(EME) and TEMP(ERATURE), respectively

(Osswald 2015: 15)

The analysis: DAs (EN)

(20) **Unmarked intrCoS/DAs** (*warm*)

(a) Argument variables	WARM (x)
(b) Valency	[NP_{NOM}]
(c) Theta- roles	x: theme
(d) Case	-
(e) Grammatical functions	Sbj
(f) Semantic decomposition	INIT (**temp-stg** ∧ TH .= x) ∧ FIN (**temp-stg** ∧ TH .= x) ∧ INIT TEMP >temp FIN TEMP

The analysis: (reflexively) marked DAs (GE)

(21) a. Die Suppe erwärmte **sich** (fünf Minuten lang). (atelic)
The soup warmed REFL (five minutes long)
'The soup warmed (for five minutes)'.

b. Die Suppe erwärmte **sich** (in fünf Minuten). (telic)
The soup warmed REFL (in five minutes)
'The soup warmed in five minutes'.

(22) **(reflexively) marked DAs** ('sich erwärmen' *warm*)

(a) Argument variables	ERWÄRMEN (*WARM*) (x)
(b) Valency	[NP_{NOM} NP_{ACC}]
(c) Theta- roles	x: theme **sich: expletive**
(d) Case	-
(e) Grammatical functions	Sbj
(f) Semantic decomposition	INIT (**temp-stg** ∧ TH .= x) ∧ FIN (**temp-stg** ∧ TH .= x) ∧ INIT TEMP >temp FIN TEMP

The analysis: marked DAs (GR)

(23) **Marked DAs** (‘zestenete‘ *warm*) (GR)

(a) Argument variables	ZESTENE**TE** (*WARM*) (x)
(b) Valency	[NP_{NOM}]
(c) Theta- roles	x: theme
(d) Case	-
(e) Grammatical functions	Sbj
(f) Semantic decomposition	INIT (**temp-stg** ∧ TH .= x) ∧ FIN (**temp-stg** ∧ TH .= x) ∧ INIT TEMP >temp FIN TEMP

Conclusions

- The analysis
  - provides support for the position that a mix of Valency and Argument Structure Approaches is needed
  - is the basis for German, Englisch and Greek. The three languages differ in how the morphology is realized: German has a morphologically marked „sich“, which is absent from English, while in Greek some intrCoS / anticausatives appear with non-active morphology
  - proposes a set of rules which relate syntactic and semantic information to each other

- The semantic decomposition treatment of trCoS/causative, intrCoS / inchoative / anticausative help us explain the different patterns found in these three languages, since it provides details about verb-formation

- This is necessary in order to be able to account for different uses of CoS verbs in particular those that might be possible to L1 and L2 learners

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