Semantic restrictions on alternating CoS verbs -
The case of romper

Alexandra Anna Spalek,
Universitat Pompeu Fabra
(alexandra.spalek@upf.edu)

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1 Introduction

The causative-anticausative alternation has been the topic of an intense discussion, which has produced a considerable amount of studies from different theoretical perspectives (Brosseau and Ritter, 1991; Haspelmath, 1993; Levin and Rappaport Hovav, 1995; Mendikoetxea, 1999; Chierchia, 2004; Alexiadou et al., 2006; Reinhart, 2006; Koontz-Garboden, 2009; Labelle and Doron, 2012; Piñón, 2001; Horvath and Siloni, 2011; Rappaport Hovav and Levin, 2012).

- Alternating causative verbs like Spanish romper ‘break’ have been claimed to be underspecified in the thematic nature of the causing eventuality:

Causes of breaking-events can range from agents, instruments and natural causes, to all kinds of events (Levin and Rappaport Hovav, 1995; Reinhart, 2006; Mendikoetxea, 1999):

(1) Juan/ el hacha/ el huracán/ el peso de los libros/ la explosión rompió la mesa.
  ‘Juan/ the axe/ the hurricane/ the weight of the books/ the explosion broke the table.’
  (Adapted example from Mendikoetxea 1999: 1589)

- This underspecification in the causing eventuality has been correlated with the possibility of omitting the causing argument: romper regularly appears in the anticausative variant (2).

(2) La mesa se rompió.
  ‘The table broke.’

PUZZLES:

- Corpus data hints at the fact that for certain object choices the change of state verb romper ‘break’ does not allow for all kinds of causes, as illustrated in (3-b).

1See Van Voorst (1995) for an exhaustive literature review on the underspecified character of the causing eventuality of breaking.

2This study is based on a 250 million word Spanish press corpus, the El País Corpus. The corpus consists of all the El País newspaper issues from 1976 to 2007 and is hosted at the Insitut Universitari de Linguistica Aplicada (IULA) at the Universitat Pompeu Fabra.
Corpus study also leads to the insight that, unlike physical objects that can undergo breaking both as objects of transitives (1) and as subjects of intransitives (2), certain abstract objects cannot be subjects of intransitive romper (4).

(4) #La norma se rompió.  
The norm REFL broke.  
‘The norm broke.’

*Romper* does not seem to be cause-underspecified across the board:

– Certain romper-events cannot be caused by instruments or natural forces, but require agents.

– Agentive romper-events preclude the anticausative form.

**GOALS:**

– Based on an exhaustive corpus study on Spanish CoS verbs I analyse in detail:

  1. *when* the anticausative variant of romper is not possible
  2. *when* the whole range of causes is disallowed
  3. *why* certain kinds of romper-VPs restrict the thematic role of their external arguments

– I take the irregularities in the verbal alternations to illustrate that languages encode a sophisticated system of semantic types that, when combined yield results that are not transparently related to their parts.

– I represent the differences in verb alternations by the difference in the output that a particular instance of the polymorphic type ROMPER yields.

Concerning the relation between the different alternations of the verb, this talk will not add any further to the debate about the order of the derivation.

**ROADMAP:**

– Section 2: quick outline of some well-known approaches to the causative-anticausative alternation

– Section 3 and 4: exploration of two aspects that seem to be influential in the nonexistence of anticausative variants of certain romper-sentences:

  1. Causes versus Agents
  2. Physical Themes versus Abstract Themes
2 The causative-anticausative alternation

Change of state verbs have been considered the core class of causative alternating verbs (Jespersen, 1927; Levin and Rappaport Hovav, 1995; Reinhart, 2006). The break-verb class in Levin (1993).

- Traditionally two derivational accounts have been suggested for the relationship between the transitive and the intransitive variants:
  - Causativization approach (Lakoff, 1968; Dowty, 1979; Parsons, 1990)
  - Decausativization approach (Levin and Rappaport Hovav, 1995; Reinhart, 2000)

- Neither of the two approaches handles all the morphological and semantics facts, such that there remain exceptions like the ones illustrated in (3-b) and (4).

From the Distributive Morphology perspective (Alexiadou et al., 2006) there exist several classes of core meanings of verbs instantiated as roots:

- √agentive (assassinate)
- √internally caused (bloom)
- √externally caused (destroy)
- √cause unspecified (break)

- All roots except the agentive one allow for the alternation.

- According to this classification break is not specified for external or internal causation and is not considered an agentive root. It thus remains unexplained why it subcategorises for agents in certain cases (3-a) and does not always alternate.

Several authors have hinted, in one way or another, is the fact that sentences that do not allow for the alternation require agents (Levin and Rappaport Hovav, 1995; Van Voorst, 1995; Alexiadou et al., 2006; Koontz-Garboden, 2009).

3 Causative versus agentive CoS verbs

Some facts about the Spanish anticausative form:

- In Spanish the anticausative clitic is morphologically identical to the reflexive: se³.

- Spanish se, unlike English himself, herself, itself, does not have any kind of agentivity implications in which the single argument has to act upon him/herself.

Following Koontz-Garboden (2009) I assume that the anticausative in Spanish is the result of a process of reflexivization of a causative counterpart⁴. I thus adopt his account for the explanation of the lack of the anticausative, when it is absent.

³It has been observed in general that languages that favour anticausative alternations regularly mark the derivation of an anticausative verb (Haspelmath, 1993).
⁴See also Chierchia (2004) for an argument in favour of analysing anticausatives as reflexives.
Koontz-Garboden (2009) distinguishes among underspecified causative verbs (5) and truly agentive verbs (6) and suggests two different lexical semantic representations:

- Underspecified causative verbs have a generalised thematic role \textit{EFFECTOR}$^5$ that corresponds to underspecified causes, as in (5):

  \begin{equation}
  ([\text{romper}]) = \lambda x \lambda y \lambda s \lambda e [\exists v [\text{CAUSE}(v,e) \land \text{EFFECTOR}(v,y) \land \text{BECOME}(e,s) \land \text{THEME}(s,x) \land \text{not-whole}(s)]]
  \end{equation}

\textit{Romper} names an event $e$ of a participant $x$ coming to be in state $s$, with that CoS event being caused by an eventuality $v$ in which another entity $y$ is a participant.

- Agentive verbs such as \textit{asesinar} ‘assassinate’ have the agentive (non-underspecified) thematic role \textit{AGENT}:

  \begin{equation}
  ([\text{asesinar}]) = \lambda x \lambda y \lambda s \lambda e [\exists v [\text{CAUSE}(v,e) \land \text{AGENT}(v,y) \land \text{BECOME}(e,s) \land \text{THEME}(s,x) \land \text{not-alive}(s)]]
  \end{equation}

(7) Juan/\#el hacha/\#el accidente/\#la explosión asesinó al senador.
Juan/ the axe/ the accident/ the explosion assassinated the senator.
‘Juan/ the axe/ the accident/ the explosion assassinated the senator.’

This difference in thematic roles in the causing event has a significant impact on the denotation of the verb when the reflexivization operation is applied to it.

1. Reflexivization of a causative verb gives an anticausative reading where the undergoer of the CoS event is also the (not implicitly agentive) \textit{EFFECTOR} in the event that causes the change of state.

  \begin{equation}
  ([\text{romperse}] = \lambda x \lambda y \lambda s \lambda e [\exists v [\text{CAUSE}(v,e) \land \text{EFFECTOR}(v,x) \land \text{BECOME}(e,s) \land \text{THEME}(s,x) \land \text{not-whole}(s)]]
  \end{equation}

(11) La mesa se rompió (por sí sola).
The table REFL broke (by self alone).

Accordingly two \textit{romperse} uses can be distinguished:

1. A causative \textit{romper} will allow for the anticausative$^6$.

\begin{equation}
(\text{10}) \quad ([\text{romper}] = \lambda x \lambda y \lambda s \lambda e [\exists v [\text{CAUSE}(v,e) \land \text{EFFECTOR}(v,y) \land \text{BECOME}(e,s) \land \text{THEME}(s,x) \land \text{not-whole}(s)]]
\end{equation}

\begin{equation}
(\text{11}) \quad \text{La mesa se rompió (por sí sola).}
The table REFL broke (by self alone).
\end{equation}

$^5$The \textit{EFFECTOR} role was first introduced in Van Valin and Wilkins (1996).

$^6$See the appendix for the whole derivation of the anticausative variant from the causative one (Koontz-Garboden 2009: 86).
‘The table broke (by itself).’

2. An agentive romper would trigger a true reflexive and thus lacks the anticausative meanings in which the single argument is a non-agentive undergoer of a change of state event. This is the reason why we do not get examples like (12).

(12) #La ley se rompió (por sí sola).
The law REFL broke (by self alone).
‘The law broke (by itself).’

Summing Up:

- We have observed that the semantic nature of the theme determines the thematic nature of the causing participant.
- Koontz-Garboden (2009) explains why agentive verbs, such as asesinar ‘assassinate’, cannot anticausativize, which can be extended to the case of certain romper-VPs.
- We have an explanation for when certain uses of romper lack the anticausative and preclude instruments and natural forces as causes8.
- The object-subject interdependencies of romper sentences seem to indicate that agentivity is not exclusively inherent to the verb, but can also be a characteristic of the VP. (See Alexiadou et al. (2006) for a similar insight on the difference between Agentivity on the root and Agentivity on the VP level.)
- We are left with the question why certain romper-VPs are necessarily agentive.

4 Physical themes versus abstract themes

- Piñón (2001) derives both the causative and the anticausative from an underspecified stem9.

(13) a. \( V_{stem} \to V_{caus-incho} \)
b. \( V_{stem} \to V_{incho} \)

- For him the difference in morphosyntactic alternations for one and the same verb in relation to the choice of the theme is a question of two separate lexical entries:

(14) a. Concrete breakings: physical themes do not require agents
b. Abstract breakings: abstract themes do require agent

- However this is an overgeneralisation: the causative-anticausative alternation of romper is regular for many kinds of abstract-object-themes, as illustrated in (15) through (16).

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7The antecedent of this idiomatic anaphor ‘por sí solo/a’ must be construed as the sole cause of the event under consideration.

8Similar object-subject dependencies have been observed by Rappaport Hovav and Levin (2012) and explained away by the need of direct causation.

9See Dowty (1979) and Parsons (1990) for a similar idea of deriving both variants from an adjectival base. The Y-model by Piñón (2001) differs from Parsons’ in that it directly derives both the causative and the anticausative from a common verb stem instead of having two sequences of derivation out of the adjective.
(15) a. La abstención del PSOE rompe la tradicional unanimidad en la aprobación del programa de fiestas. [El País Corpus]
   ‘The abstention of the Spanish Socialist Party breaks the traditional unanimity in the approval of the program of the festival.’

b. La unanimidad se rompió.
   ‘The unanimity broke.’

(16) a. La crisis inmobiliaria rompió el desarrollo económico de España.
   ‘The housing crisis interrupted the economic development of Spain.’ [El País Corpus]

b. El desarrollo económico de España se rompió.
   ‘Spain’s economic growth stopped.’

• Corpus data illustrate that the abstract themes that preclude the alternation essentially belong to a very restricted semantic class: the world of human norms and laws10.

• Although uses of romper with this kind of themes generally subcategorise for agents, they may also allow for agent-related actions as in (17).

(17) La autorización de la ikurriña rompió un tabú que parecía sagrado.
   ‘The authorization of the Basque flag broke a taboo that seemed sacred.’
   [El País Corpus (adapted)]

Summing Up:

• The semantic selectional restrictions seem to be much more fine-grained than previous acknowledged.

• The semantic nature of the theme makes a difference to what the VP ends up denoting.

• It should not be surprising that the restrictions imposed on the external argument are different in each case.

• This problem has hardly received attention as an issue of semantic composition.

5 A semantic account of object-subject interdependencies

5.1 The basic idea behind Type Composition Logic

In Type Composition Logic (Asher, 2011) each word stem is assigned a type and each predicate places type presuppositions on its arguments:

• A transitive verb passes its type presuppositions to its object.

• A VP passes its type presuppositions to its subject.

10 Among the themes attested in corpus that subcategorise agents are: molde ‘mould’, código de conducta ‘code of behaviour’, tradición ‘tradition’, costumbre ‘custom’, esquemas de pensamiento ‘schema of thought’.
5.2 Towards a TCL account

The internal semantics of the argument gives rise to a subtle shift in the resulting predication with *romper*:

- The *romper*-VPs subcategorise for agents
- The change of state applies to the subject as well as to the object: the agent’s relation towards the object (state in force/ in use) undergoes a change, as illustrated in (18) through (23)\(^\text{11}\).

\[(18)\] Juan rompió la norma/ ley/ tabú.  
Juan broke the norm/ law/ taboo.  
‘Juan broke the norm/ law/ taboo.’

\[(19)\] Obama rompió la tradición: no se sacó la foto en camisa hawaiana y Obama broke the tradition: not REFL took the picture in Hawaiian and garlands.  
‘Obama broke the tradition: He did not take the picture in Hawaiian shirt and garlands.’ [Web]

- The impression that the change is not solely about what happens to the denotation of the direct object is further supported by the results of applying affectedness tests (See Beavers (2011) for more affectedness tests.):

1. What happened to x is that it v-participle

\[(20)\] Lo que le pasó a la ventana es que Obama la rompió.  
What that to it happened to the window is that Obama it broke.  
‘What happened to the window is that Obama broke it.’

\[(21)\] #Lo que le pasó a la tradición es que Obama la rompió.  
What that to it happened to the tradition is that Obama it broke.  
‘What happened to the tradition is that Obama broke it.’  
\[\neq\] The tradition ceased to exist.

2. \(\phi\) (predicate) but not \(\psi\) (target state)

\[(22)\] #Obama rompió la ventana, pero la ventana no está rota.  
Obama broke the window, but the window is not broken.  
‘Obama broke the window, but the window is not broken.’

\[(23)\] Obama rompió la ley, pero la ley no está rota.  
Obama broke the law but the law is not broken.  
‘Obama broke the law, but the law is not broken.’

What are the themes *leyes* ‘laws’, *normas* ‘norms’ and *tabús* ‘taboos’ like?

- *Leyes* ‘laws’, *normas* ‘norms’ and *tabús* ‘taboos’ are essentially inert and ultimately depend on the intervention of an agent to change them\(^\text{12}\). This precludes them to be modified by an idiomatic anaphor ‘por sí sola/a’, which would make them the sole cause of the event:

\(^{11}\)See Van Voorst (1995) for a similar observation

\(^{12}\)See Brosseau and Ritter (1991) for a related observations on objects of *brisé*.  

(24)  #La norma/ ley se rompió por sí solo/a.
The norm/ law REFL broke by self alone.
‘The law/ norm broke by itself.’

- Affectedness tests ((20) through (23)) show that leyes ‘laws’, normas ‘norms’ and tabús ‘taboos’, contrary to physical objects do not end up in a new state when broken, despite the fact that individuals overcome or violate them.

Summing Up:

- Leyes ‘laws’, normas ‘norms’ and tabús ‘taboos’ are fundamentally inert and cannot be the causes of their own change. This explains why certain romper-VPs require agents or agent-related actions.

- Given the fine-grained distinctions that predication is sensitive to, we need to resort to very fine-grained types associated with words to explain the difference in meaning and syntactic alternations.

- Type Composition Logic is a framework that generally assumes functor types may provide different value types, when they take arguments of different fine-grained types: the internal semantics of words can affect logical form.

5.3 A TCL proposal

Corpus data illustrate that romper applies both to physical objects and states\(^{13}\): ROMPER restricts its arguments to be of type PHYSICAL-OBJECT (P) or STATE (S).

(25)  a. ROMPER(P) e.g.: romper ventana
    b. ROMPER(S) e.g.: romper silencio

How can these fact be extended to romper una ley?

- If nouns like ley, norma, tabú can be attributed the type S then the predication will succeed.

- Abstract objects such as ley, norma, tabú are not inherently states, but rather stand in for states that describe a relation the agent has to the law or norm being in vigour.

- In other words, a default relation is established, which the agent can only consciously alter.

- That is, ley, norma, tabú can be coerced to a subtype of state, which I will call a relational state: \([\text{relational states}] \sqsubseteq [\text{state}]\)

- The type of output of the romper-function varies in a significant way with the denotation of the internal argument:

  1. When we predicate breaking of a physical object (P) we refer to the object as undergoing a change in physical state.

  2. When we predicate breaking of a relational state (RS), this change entails some action on the part of the individual that stands in the state to the law, norm, etc., which is what forces there to be an agent argument.

\(^{13}\)In fact corpus data illustrate that romper also readily combines with some kinds of events and processes. See the appendix for more corpus data.
Consequently we can define two distinct *romper*-functions ranging over distinct kind of arguments:

\[(26)\]

a. Romper(P): denote functions from physical objects to causes to propositions  
b. Romper(RS): denote functions from relational states to agents to propositions  

**How can this composition be expressed in TCL types?**

- To account for the general dependency of the polymorphic type ROMPER\(^{14}\) on its argument, I will use the a **general type** \(E\) such that:
  
  - ROMPER (E)  
  - PHYSICAL-OBJECT, STATES \(\subseteq E\)

- Thus we get a type of \([\text{ROMPER}]\) with two subtypes:
  1. \([\text{ROMPER}]\) RELATIONAL STATE \(\rightarrow\) HUMAN \(\rightarrow\) Proposition about the relation  
  2. \([\text{ROMPER}]\) E \(\rightarrow\) CAUSE \(\rightarrow\) Proposition about the target state

- If *ley* is of type LEY: RS, the interpretation (28-c) of sentence (27) is well formed\(^{15}\):

\[(27)\]  
Juan rompió la ley.  
Juan broke the law.  
‘Juan broke the law.’

\[(28)\]

a. \(\exists s : STATE. [\text{romper}] ([\text{Juan}], s)\)  
b. \(\exists h : HUMAN. [\text{romper}] (h, [\text{ley}])\)  
c. \([\text{romper}] ([\text{Juan}], [\text{ley}])\)

- The definition of (26) triggers sentences such as (29) undefined, since causes cannot apply to relational states like *ley*.

\[(29)\]  
#El viento rompió la ley.  
The wind broke the law.  
‘The wind broke the law’

**6 Conclusions**

- I have explored two kinds of uses of the verb *romper* attested in corpus, which show distinct argument alternation possibilities:

  1. **Romper** can denote physical change events: truly causative verb and allows for the anticausative alternation  
  2. **Romper** can denote a relational change: agentive verb and precludes the anticausative alternation

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\(^{14}\)ROMPER is a polymorphic type because the value of ROMPER applied to its argument depends on the type of the argument.  
\(^{15}\)It is necessary to declare here that \([\text{Juan}] \subseteq [\text{human}]\).
I have drawn on the agentivity analysis by Koontz-Garboden (2009) to explain why certain *romper*-sentences cannot appear in the anticausative form.

I have illustrated that the lack of the anticausative in fact only occurs in composition with a very restricted class of objects, which can be coerced into a subclass of states, relational states.

The characteristic inertia of relational states has helped explaining why they restrict their subject to be agents.

Type Composition Logic has turned out to be a flexible enough framework to allow VPs to impose presuppositions on their external arguments.

7 Appendix

7.1 Anticausativization is semantically an reflexivization operation

- Causative variant of *romper*:
  \[
  [\text{romper}] = \lambda x \lambda y \lambda s \lambda e [\exists v (\text{CAUSE}(v, e) \land \text{EFFECTOR}(c, v) \land \text{BECOME}(e, s) \land \text{THEME}(s, x) \land \text{not-whole}(s))]
  \]

- Reflexive clitic *se*, which takes a two argument predicate and reflexivize it, giving *se* the following denotation: \([se] = \lambda R \lambda x [R(x, x)]\)

- Applying the reflexivization operation to the causative *romper* yields a anticausative *romperse*: a function from individuals to states of CoS events in which the individual undergoing the change is also the EFFECTOR participant in the event that causes the change:
  \[
  [se] ([\text{romper}]) = \\
  \lambda R \lambda x [R(x, x)](\lambda x \lambda y \lambda s \lambda e [\exists v (\text{CAUSE}(v, e) \land \text{EFFECTOR}(v, y) \land \text{BECOME}(e, s) \land \text{THEME}(s, x) \land \text{not-whole}(s))])
  \]

  \[
  = \lambda x [\lambda x \lambda y \lambda s \lambda e [\exists v (\text{CAUSE}(v, e) \land \text{EFFECTOR}(v, x) \land \text{BECOME}(e, s) \land \text{THEME}(s, x) \land \text{not-whole}(s))]](x, x)
  \]

- Given that *romper* is thematically underspecified and *se* lacks any agent entailments, there is no prediction that the single argument of the anticausative should have agent entailments.

7.2 Further examples of *romper* with state or event arguments

7.2.1 States

(30) RDA
The German Democratic Republic *rompió* la igualdad que existía en Munich con
the equality that existed in Munich with USA.‘The German Democratic Republic broke the equality that existed in Munich with the USA.’ [El País Corpus]

(31) La muerte de Mateotti *rompió* para siempre el crédito de Mussolini.
The death of Mateotti broke for always the credit of Mussolini.‘Mateorri’s death broke Mussolini’s credit for ever.’ [El País Corpus]
(32) Las autoridades chinas rompieron por fin su mutismo.
The authorities Chinese broke for end their silence.
‘The Chinese authorities finally broke their silence.’ [El País Corpus]

7.2.2 Events

(33) La revolución de octubre rompió el desarrollo orgánico de la intelectualidad del país.
The revolution of October broke the development organic of the intellectuality of the country.
‘The October Revolution broke the organic development of the intellectuals of the country.’ [El País Corpus]

(34) Telefónica rompe la mejora de la Bolsa.
Telefónica breaks the improvement of the stock market.
Telefónica breaks the improvement of the stock market. [El País Corpus]

References


