Causality by Adjuncts: Spanish *de*-PP

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Introduction

In keeping with most event structure approaches (McCawley 1968; Dowty 1979; Jackendoff 1990; Levin & Rappaport Hovav 1995), causality in Role and Reference Grammar (RRG) (Foley & Van Valin 1983; Van Valin & LaPolla 1997; Van Valin 2005) has been traditionally viewed as a notion embodied in a single operator: CAUSE. The logical structure (LS) for causative eventualities is shown below.

(1) α CAUSE β, where α and β are logical structures of any type (Van Valin 2005: 45)

Consider the following Spanish sentences expressing causative relations. While the LS in (1) correctly captures this for (2), this is not so clear for (3).

(2)	*Pedro/ Un cáncer mató a Felipe.* 'Pedro/ Cancer killed Felipe.'		[**do** ´ (Pedro, Ø)] CAUSE [INGR **dead** ´ (Felipe)]
(3)	*Felipe se murió de cáncer / *de Pedro.* 'Felipe died of cancer/ of Pedro.'	??	[**have** ´ (Felipe, cancer)] CAUSE [INGR **dead** ´ (Felipe)]

- Why is the lexical relation shown in (3) not lexicalised as the one in (2)?
- Why is the second argument of the state predicate in (3)—*cáncer* 'cancer'—the Effector?
- Why is an animate individual like *Pedro* barred from appearing as the Effector in (3)?
- Why is the Effector in (3) coded as an Adjunct phrase headed by the preposition *de*?

To start with, the main piece of evidence to treat *cáncer* 'cancer' in the *de*-PP in (3) as Effector on a par with subject Effectors is that they too pass the causality test of being paraphrasable as *X caused Y to happen* (Levin 2009; Van Valin & LaPolla 1997: 97; Van Valin 2005: 38).

(2) a. ***Pedro*** *mató a Felipe.* b. *Pedro causó que Felipe muriera.* 'Pedro caused Felipe to die.'
(3) a. *Felipe murió de* ***cáncer****.* b. *El cáncer causó que Felipe muriera.* 'Cancer caused Felipe to die.'

It must be pointed out that *de* is not the only preposition that can introduce an Effector in Spanish. Of special interest for the comparison with *de* are *con* 'with' and *por* 'for, from'.

(4) *La puerta se cerró* ***con el viento****.* Cf. **La puerta se cerró* ***del viento****.*
'The door closed with the wind.'
(5) *El niño se asustó* ***por el payaso****.*
'The kid got scared of/by the clown.'

Importantly, the preposition is not the result of lexical selection, as the same verb can have different prepositions introduce different Effectors. In (6) the three arguments in bold play a role in the causal chain.

(6) ***La maestra*** *hizo temblar* ***de miedo*** *a los niños* ***con sus historias****.*
'The teacher made the children shiver from fear with her stories.'

This suggests that *de*-PP introduces a specific type of Effector different from those that occur in subject position and those introduced by other prepositions.

As RRG practitioners, we believe in a **systematic** and **tight** correlation between form and meaning at the center of every grammar.

Yet, we have presented what seems to be an **inconsistency**: a semantic component like CAUSE that is not only central to the description of lexical meaning but also to the syntax-semantics interface shows up in two radically different grammatical domains: LSs projected onto **core syntax** and **peripheral adjuncts**. The idea of a central semantic component freely linked to any syntax is untenable.

Our hypothesis for this research is that there are **semantic** properties that **differentiate** CAUSE in each syntactic domain.

The aim of this presentation

The aim of this presentation is to characterize the causal relation and the properties of the Effector coded by *de*-PP adjuncts in Spanish. We will call this Effector '**C-Source**' (Causal Source) and claim that it is different not only from the lexically encoded ones but also from the ones introduced by PP adjuncts headed by other prepositions such as *con* and *por*.

Outline of this presentation

- Operationalizing C-Source
- Prototypical cases of C-Source
- Non-prototypical cases of C-Source
  - Means *de*-PPs
  - *De tanto*-PPs
- C-Sources with psych-verbs
- How is CAUSE possible in this grammatical setting?
- Conclusions

Operationalizing C-Source

We operationalize C-Source as an Effector that includes the following semantic properties.

Properties of C-Source	Implied properties
Immediate	**→ direct**
(Internal)	**→ not individual → inanimate → unintentional**
(Inactive)	
(Ultimate)	

Our proposal is that the **prototypical** C-Source is an **immediate, internal, inactive, and ultimate Effector.** As such, this characterization in terms of a prototype allows for **deviations**.

An **immediate** cause is a causal factor in a causal chain (Croft 1991, 2012; Talmy 1976) that is temporally and spatially immediate to the Effected event and its Patient. By definition, this is also a **direct** cause (Shibatani & Pardeshi 2002).

By **internal** we understand a causal factor that is part of or occurs in a part of the causally affected Patient. This feature triggers implicational relations. If C-Source is internal, it cannot be a separate entity from the Patient, hence it cannot be an **individual**, and if it is not an individual, it's **inanimate** and is thus **unintentional.**

We take **inactive** to mean that the C-Source entity has no control over the causing event nor is it controlled by another participant (De Lancey 1984). Typically, this inactivity correlates with state predicates.

Then, **ultimate** is the last causal factor in a causal chain, namely, one that does not need a previous causal factor to have its effect.

Prototypical C-Sources

There's a readily recognizable set of prototypical Effectors that can be introduced by *de*.

Diseases

(7) a. *Felipe murió **de cáncer**.*
'Felipe died of cancer.'

b. *Nicolás se enfermó **de gripe**.*
'Nicolás came down with the flu.'

Conditions

(8) a. *El espejo brilló **de limpio**.*
'The mirror shone due to being (so) clean.'

b. *El queso apesta **de rancio**.*
'The cheese stinks because it's rancid.'

Bodily Sensations

(9) a. *Un joven se paralizó **de frío**.*
'A young man paralyzed from the cold.'

b. *El jugador se dobló **de dolor**.*
'The player bent in pain.'

Emotions

(10) a. *Los niños temblaron **de miedo**.*
'The children shivered in fear.'

b. *José bailó **de alegría**.*
'José danced because he was happy.'

Ideas/Memories

(11) a. *Arnulfo sonrió **de sus ocurrencias**.*
'Arnulfo smiled as he thought of his ideas.'

b. *Julia se ruborizó **de sus travesuras**.*
'Julia blushed as she thought of her mischief.'

As was said above, C-Source is the last possible Effector in the causal chain. In other words, it is **immediate** as nothing stands between it and the causally affected participant.

(10) a. *Los niños temblaron **de miedo**.*
'The children shivered in fear.'

This becomes clear when other Effectors are mentioned. C-Source takes up the last slot in the causal chain before the Effected event.

(12) ***La maestra** hizo temblar **de miedo** a los niños **con sus historias**.*
'The teacher made the children shiver from fear with her stories.'

Effector 1: the teacher >> Effector 2: her stories >> Effector 3: fear >> the children shivered

Additionally, these causes are either states ascribed to the subject participant or an event that is located within him/her. All of them are circumscribed to the physical, mental, and/or emotional sphere of the participant, that is they are **internal**.

(8) a. *El espejo brilló **de limpio**.*
'The mirror shone due to being (so) clean.'

When not internal, they result in unacceptability.

(13) a. ??*El espejo brilló **del producto de limpieza/ la luz/ frotarlo**.*
'The mirror shone due to the cleaning product/ the light/ scrubbing it.'
b. ??*Juan tembló **de la amenaza/ los alaridos/ el monstruo**.*
'Juan trembled of the threat/ the shrieks/ the monster.'
c. ??*El anfitrión lloró **de los nervios de su invitado**.*
'The host cried because his guest was nervous.'

As it's internal, it's not individual, hence inanimate and devoid of intention.

As we said before, C-Source is **inactive**.

(7) a. *Felipe murió **de cáncer**.*
'Felipe died of cancer.'

(9) a. *Un joven se paralizó **de frío**.*
'A young man paralyzed from the cold.'

Cancer and cold are clearly not entities that possess control or that can be controlled by somebody.

Finally, C-Source is able to be a sufficient condition for the causal relation to obtain as no other causal factor is necessary. This means it can be portrayed in a sentence as the **ultimate** Effector.

(11) a. *Arnulfo sonrió **de sus ocurrencias**.*
'Arnulfo smiled as he thought of his ideas.'

Having an idea is by itself a sufficient cause for smiling. No other previous causal factor is required.

Note the last three properties differentiate C-Source from instrument Effectors, which by definition are not internal, controlled, and imply the presence of a previous agent Effector.

(12) ***La maestra** hizo temblar **de miedo** a los niños **con sus historias**.*
'The teacher made the children shiver from fear with her stories.'

Non-prototypical C-Sources: Means *de*-PPs

There are also instances of *de*-PP with a Means sense. Means is a relation that conflates cause and manner (París 2019).

(14) a. *Bruno abrió la puerta **de una patada**.*
'Bruno opened the door with a kick.'
b. *El sicario mató al político **de un disparo**.*
'The hitman killed the politician of a shot.'

a'. *Una patada de Bruno causó que la puerta se abriera.*
'A kick by Bruno caused the door to open.'
b'. *El disparo del sicario causó que el político muriera.*
'A shot by the hitman caused the politician to die.'

Note that *una patada* 'a kick' and *un disparo* 'a shot' stand between the affected entity—*la puerta* 'the door' and *el político* 'the politician'—and the agent—*Bruno* and *el sicario* 'the hitman.' In this sense, they are **immediate**.

Effector 1: Bruno >> Effector 2: a kick >> the door opened

However, unlike prototypical C-Sources they are **not internal** and **not inactive** as they are controlled by the agent (cf. **Bruno abrió la puerta de una patada de Carlos/ *El sicario mató al político de un disparo del mercenario*), and **not ultimate**.

At the same time, they carry a distinct Means sense as they specify what the agent did to bring about the change of state in the affected entity. Note it can be paraphrased by the Gerund Construction, the typical strategy to express Manner-Means in Spanish.

(15) a. *Bruno abrió la puerta **pateándola**.*
'Bruno kicked the door open.'
b. *El sicario mató al político **disparándole**.*
'The hitman shot the politician dead.'

In contrast to adverbial gerunds, the C-Source Effector has to denote a punctual eventuality.

Consider the following two similar-looking *de*-PPs.

(16) a. *Bruno entró a la habitación* ***de un salto****.*
'Bruno leapt into the room.'
b. *El sicario mató al político* ***de costado****.*
'The hitman killed the politician sideways.'

Like other manner expressions, they can answer a *How?* question.

(17) a. *¿Cómo entró Bruno a la habitación?* *De un salto.*
'How did Bruno enter the room?' 'With a leap.'
b. *¿Cómo mató mató el sicario al político?* *De costado.*
'How did the hitman kill the politician?' 'Sideways.'

However, the do not convey a causative sense as they do not pass the *cause to happen* test.

(18) *?Una saltó de Bruno causó que entrara a la habitación.*
'A leap by Ana caused her to enter the room.'
?Un costado causó que le sicario matara al político.
'A side caused the hitman to kill the politician.'

Non-prototypical C-Sources: *de tanto*-PPs

Another non-prototypical variant of C-Source has a verb as the object of the PP; in addition, this verb is necessarily modified by an event quantifier, as is attested by the unacceptability of (19a').

(19) a. *Pedro se murió **de tanto fumar**.*
'Pedro died due to too much smoking.'

a'. ??*Pedro se murió **de fumar**.*
?? Pedro died of smoking

b. *Me dolían los ojos **de tanto sol**.*
'My eyes ached because of so much sunlight.'

b'. *??Me dolían los ojos **del sol**.*

c. *La planta se pudrió **de tanto regarla**.*
'The plant rotted due to too much watering.'

c'. ??*La planta se pudrió **de regarla**.*

De tanto-PPs deviate from prototypical C-Sources in that the causing events might take place under the control of the causally affected participant—*fumar* 'smoke'—or another participant—*regar* 'water'— which makes them **active**. Also, they might refer to entities located beyond the participant's personal sphere—*sol* 'sun'—so it's **not internal**. However, they are **immediate**, and as events, **ultimate**, just like prototypical C-Sources.

Notice that the need of the event quantifier *tanto* is not required by the relation between the events. A causal relation can indeed hold without the quantifier with *por*-PP.

(20) *Margarita murió por fumar.*
'Margarita died from smoking.'

Our hypothesis is that the need of the quantifier comes from the requirement that demands to bound the causing Activity. The quantifier introduces a boundary to an otherwise unbounded activity—e.g., *regar* 'water,' *fumar* 'smoke'. That is, the smoking reached and trespassed a limit (the one of normalcy) and this bounded event can be now part of a sequential causal relation.

C-Source with psych verbs

It might seem that Psych verbs correlates with non-typical C-Sources; however, we claim that they are prototypical.

(21) a. *El niño se asustó del payaso.*
'The kid got scared of the clown.'

a'. *El payaso causó que el niño se asustara.*
'The clown caused the kid to get scared.'

The specific role these Effectors is that of Stimulus. We take them to be partially **internal** since they necessarily involve an Experiencer's **internal** mental representation in addition to its external existence. It is also **immediate** and **ultimate**.

In addition, the stimulus in (21) is **not intentional**. This becomes evident when contrasted with its transitive counterpart. While a continuation that asserts intentionality is felicitous with the latter, it is not with *de*-PP.

(22) a. *El payaso asustó al niño. Este lo hizo a propósito.*
'The clown scared the kid. He did it on purpose'

b. *# El niño se asustó del payaso. Este lo hizo a propósito.*
'The kid got scared of the clown. He did it on purpose.

Inanimate Stimuli are compatible with *de*-PP expressions (see (23a)), but their acceptability with Agents stimuli is rather limited as shown by (23b). The difference between *los gritos* 'the shrieks' and *su palidez* 'his paleness' seems to be that only the former may be construed as **controlled** and **intentional**.

(23) a. *El niño se asustó de los gritos/ su palidez.*
'The kid got scared of the shrieks/ his paleness.'

b. *El grito/ ?la palidez asustó al niño.*
'The shrieks/ his paleness scared the kid.'

This difference is also reflected in the expression of the stimuli by means of the preposition *con* 'with.'

(24) *El niño se asustó con los gritos/ *con su palidez.*
'The kid got scared with the shrieks/ with his paleness.'

Beyond made-up examples, corpus tendencies support this insight. Out of 30 occurrences of *se assutó de* 'got scared of' in the CREA Corpus, only one contains an NP denoting an individual in the *de*-PP.

(25) *No me gusta asustar a ningún ser que se adentre en el bosque, que es mi natural dominio. La muchacha no se asustó* ***de mí****.*
'I don't like scaring any being that ventures into the forest, which is my natural dominion. The girl didn't get scared of me.'

It's noteworthy the clause is in the negative, ie, the speaker makes a point of not having caused the girl to get scared.

Summary

On balance, the differences between prototypical C-Sources, non-prototypical C-Sources, C-Sources with psych verbs, and lexical verb Effectors are summarized below.

	Prototypical C-Sources	**Non-prototypical C-Sources**		**C-Sources with psych verbs**	**Lexical verb Effectors**
		Means *de*-PPs	*De tanto*-PPs		
Immediate	✔	✔	✔	✔	✘
Internal	✔	✘	✘	✔	✘
Inactive	✔	✘	✘	✔	✘
Ultimate	✔	✘	✔	✔	✔

What makes CAUSE possible in this grammatical setting?

Alexiadou, Anagnostopoulou, and Schäffer (AAS) (2006) claims that PPs in English, German, and Greek introduce both causers and causing events only with change of state verbs.

(26) **English**

a. *The window cracked/ broke **from the pressure**.* b. *The window cracked/ broke **from the explosion**.* (p. 194)

(27) **German**

a. *Die Vase zerbrach **durch ein Erdbeben.***
the vase broke through an earthquake

b. *Die Luftqualität im Raum verschlechtert sich **durch das Rauchen von Zigaretten massiv**.* (p. 197)
the air-quality in-the room worsens REFL through the smoking of cigarettes severely

Greek

(28) a. *Ta ruxa stegnosan **apo/ me ton ilio**.*
the manuscript destroyed-N.ACT by / with the fire
'*The clothes dried by the sun.'

b. *Ta ruxa stegnosan **me to aploma ston ilio**.* (p. 198)
the clothes dried-ACT with the hanging-up under the sun
'*The clothes dried by hanging them up under the sun'

Their claim is that these verbs are ultimately causative so that the causing PP is licensed by an underlying causative element in the VP (*v*CAUS) (2006: 199) (see also Alexiadou and Anagnostopoulou 2007; Schäffer 2012: 161).

In point of fact, *de*-PPs also combine with change of state verbs in Spanish. (Some of these enter the causative alternation—like *pudrir* 'rot' or *ruborizar* 'blush'—while others do not—like *morir* 'die.')

(29) a. *La tabla se **pudrió** de vieja.*
'The board rotted due to being too old.'

Levin (2009: 7) points out that AAS's analysis predicts that causing PPs are not to be found with **unergative** verbs, which are uncontroversially non-causative (i.e., no *v*CAUS can be postulated for them). However, this is not borne out. In (30) *from the pain* conveys a causative sense (cf. (30a')) with unergative verbs of different classes.

(30) a. *He limped/cried/shivered/shuddered **from the pain**.*
a'. ***The pain** caused him to limp/cry/shiver/shudder.* (Levin 2009: 8)

Similar evidence can be presented for *de*-PP in Spanish. C-Source is indeed found with unergative verbs of different classes as well.

(31) **Agentive verbs**
a. *José **bailó** de alegría.*
'José danced because he was happy.'
b. *Arnulfo **sonrió** de sus ocurrencias.*
'Arnulfo smiled as he thought of his ideas.'

(32) **Non-agentive verbs**
a. *Un joven **tembló** de frío.*
'A young man shivered from the cold.'
b. *El anfitrión **lloró** de los nervios.*
'The host cried because he was nervous.'

(33) **Emission verbs**
a. *El espejo **brilló** de limpio.*
'The mirror shone due to being (so) clean.'
b. *El queso **apesta** de rancio*.
'The cheese stinks because it's rancid.'
c. *Daniel **gimió** de dolor.*
'Daniel moaned in pain.'

In our view, the preposition *de* is a predicative preposition (Jolly 1993; Van Valin 2005; Van Valin & LaPolla 1997) and, as such, it is what licences C-Sources.

Conclusions

Lexical causality can be part of any LS with any kind of base predicate.

(34) [ ] CAUSE [**pred'**(x)/**do'** (x, …)/ BECOME/ING/PROC pred'(x,..)]

However, it cannot be part of an LS with an unergative predicate.

(35) ***shiverize =** [ ] CAUSE [**do'** (x) **shiver'**(x)]

The startling fact is that CAUSE does combine with unergative meanings if introduced by de-PP.

(36) *Pedro tembló de miedo.*
'Peter shivered from fear'

How is this possible? Our proposal has been that de-PP introduces a particular kind of Effector: C-Source, that is, an Effector that is **immediate** and prototypically **internal, inactive** and **ultimate** and, in consequence, not an individual, inanimate and non-intentional.

There are two remaining issues that need to be address and we will do it but only tentatively.

Issues 1: How can we represent C-Source? The LS in (37) cannot do it. It seems untenable that the second argument 'y' of a state predicate—not the first argument 'x'—be a C-Source/Effector.

(37) [**have'** (x, y)] CAUSE [**do'** shiver(x)]

Our tentative solution is to explicitly introduce C-Source as a predicate on the participant joined to the argument 'y' by a conjunction as in (38). In this way, we state the interpretation of the second argument of a state as an Effector.

(38) [**have'**(x, y & C-source (y)] CAUSE [**do'** shiver(x)]

Issue 2: Linking. Sentence (39) presents problems since the unmarked linking of the first argument of a state predicate is ACTOR, but in (39) it has clearly an UNDERGOER interpretation given by the predicate **dead'**(x).

(39) *Pedro murió de cáncer.* 'Pedro died of cancer.'

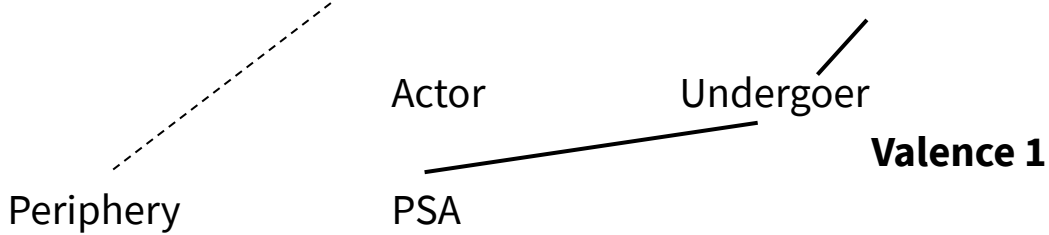
[**have'** (Pedro, cancer & C-Source (cancer))] CAUSE [**INGR dead'**(Pedro)]

Actor Undergoer

The only alternative solutions we can come up with are:

1. A marked link of state'(x,..) to Undergoer.
2. Make the linking algorithm sensitive to grammar by favoring the piece of LS provided by the (matrix) verb over the rest of the LS. Linking operates on lexicalized segment of the LS (in blue).

(40) [**have'** (Pedro, cancer & C-Source (cancer))] CAUSE [**INGR dead'**(Pedro)]



This second alternative is the one we advocate. However, it might imply a major theoretical shift: LSs are now not just extralinguistic representations—thoughts—but linguistic thinking. Semantics is entrenched in grammar and, thus, LSs are sensitive to form.

The semantics to syntax linking algorithm does not operate on plain ‘concepts’ but with representations correlated with syntactic categories like V, N or P. As we have shown, it is not the same a CAUSE predicate introduced by a V or P.

In Levelt’s production model (1989)—and the same is true for Fromkin’s model or Garrett’s model—a ‘conceptualizer’ outputs a fully-fledged cognitive representation—a thought—that is the input to the linguistic encoder or ‘formulator’. On the contrary, we are in favor of the hypothesis that linguistically expresable thoughts are not entirely precluded from formal information, perhaps more in line with the non-serial model of Dell et al. (1994). It seems an interesting research program to determine which kind of syntactic information is part of those representations, which cannot be fully-fledged linguistic form nor purely extralinguistic representations.

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