The roots of strong and weak resultatives in English and Spanish

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The 32nd Colloquium on Generative Grammar (CGG 32)
University of the Basque Country in Vitoria-Gasteiz, April 24 – 26, 2023

1 Introduction

- We consider resultatives that contain a subclass of result roots in Rappaport Hovav & Levin's (2010) sense, e.g., *break, melt, explode, tear*, that also entail change within their semantics, which we henceforth refer to as change-of-state (COS) roots (Beavers & Koontz-Garboden, 2020).
- This class of roots productively appears in both *strong and weak resultatives* in English but forms *only weak resultatives* in Spanish. Proposed constraints on root distribution, such as Manner/Result Complementarity (e.g., Rappaport Hovav & Levin, 2010), however, uniformly predict strong resultatives to be impossible with these result roots.
- We propose an account of this asymmetry between English and Spanish rooted in i) differences between the two languages with respect to the lexical semantics of this root class, and ii) independent differences in the inventory of prepositional heads available in each language.
- This allows us to explain differences in the range of possible resultatives with COS roots in English and Spanish with a single analysis for the resultatives they form in each language.

2 Background

- An influential classification regarding the range of possible resultative constructions across languages is the one proposed by Washio (1997): *strong resultatives* versus *weak resultatives*.
- This classification cross-cuts the classification of verbs as either *manner verbs* or *result verbs* in a Manner/Result Complementarity (MRC) (Levin, 1993; Levin & Rappaport Hovav, 1991, 1995; Rappaport Hovav & Levin, 2010).

(1) a. Manner verbs: *jog, run, scrub, sweep, swim, walk, wipe, hammer* ...
b. Result verbs: *break, burn, freeze, tear, rip, melt, split, burn* ...

(2) Manner/Result Complementarity: Manner and result meaning components are in complementary distribution. A verb lexicalizes only one.

- **Strong Resultatives** contain a separate phrase interpreted as the result of the action denoted by the main verb, which does not itself entail a result. The verbs involved are manner verbs e.g., *shoot*, *wipe*, *hammer* and *sweep* in (3), (Rappaport Hovav & Levin, 2010).[1]

(3) a. Yesterday police **shot** dead a miner outside Sucre.
b. He even remembered to **wipe** the knife clean of fingerprints.
c. The pendant was also silver, crudely **hammered** into a flat circle.
d. Sawdust was **swept** into a pile near the sink.

(COCA)

- **Weak Resultatives** involve result phrases that in some sense complement the meaning of the main verb (4). The verbs involved independently entail a result, and thus are result verbs, e.g., *burn*, *freeze*, *melt* and *paint* (4) (Rappaport Hovav & Levin, 2010).

(4) a. The East Village is going to be **burned** to ashes.
b. Lake Erie was **frozen** solid.
c. The last bite of ice cream has **melted** into a puddle the size of a teardrop.
d. The window trims he **painted** white and the front door red.

(COCA)

- Weak resultatives are predicted to be available in either **Satellite or Verb-framed Languages** (Talmy, 1975, 1991) since resultative semantics is encoded in the main verb.

- In contrast, verb-framed languages like Spanish, which disallow the expression of result in a phrase separate from the verb, should not allow strong resultatives (Talmy, 1975; Mateu, 2012; Mateu & Acedo-Matellán, 2012; Real-Puigdollers, 2013; Acedo-Matellán & Mateu, 2015; Bigolin & Ausensi, 2021; McNally & Spalek, 2022, *a.m.o.*).

(5) a. *El FBI **disparó** al ladrón muerto.
the.M.SG FBI shoot.PFV.3SG DOM=the.M.SG thief.M.SG dead.M.SG
Intended: 'The FBI shot the robber dead.'
b. *El camarero **fregó** la mesa limpia.
the.M.SG waiter.M.SG wipe.PFV.3SG the.F.SG table.F.SG clean.F.SG
Intended: 'The waiter wiped the table clean.'
c. *El herrero **martilleó** el metal plano.
the.M.SG blacksmith.M.SG hammer.PFV.3SG the.M.SG metal.M.SG flat.M.SG
Intended: 'The blacksmith hammered the metal flat.'

- Weak resultatives of the type discussed above (4) for English are frequently attested in Spanish (6).[2]

[1] English examples were extracted from Google Books (GBooks), Corpus of Global Web-Based English (GloWbE) (Davies, 2013) and Corpus of Contemporary American English (COCA) (Davies, 2008). Spanish examples were extracted from Corpus del Español (CES) (Davies, 2002), Corpus de Referencia del Español Actual (CREA) (Real Academia Española, N.D.) and Google Books (GBooks). Examples with no source have been constructed by us, and examples extracted from simple web searches are indicated with "Web".

[2] In some Romance languages such as Spanish, Italian and Catalan, there exists a type of resultative construction that Arm-

(6) a. Me **teñí** el pelo de color azul.
DAT.1SG dye.PFV.1SG the.M.SG hair.M.SG of color.M.SG blue.M.SG
'I dyed my hair blue.' (GBooks)

b. La puerta se **rompió** en mil astillas.
the.F.SG door.F.SG REFL break.PFV.1SG in thousand splinters.F.PL
'The door broke into a thousand splinters.' (GBooks)

c. Un corazón [...] que volvía [...] **destrozado** en mil pedazos
a.M.SG heart [...] that return.PFV.3SG [...] destroy.PTCP.M.3SG in thousand pieces.M.PL
'A heart that would come back in the morning destroyed into a thousand piece.' (CREA)

d. Lo agarró por la cabeza y lo **quemó** en cenizas con fuego azul.
ACC.M.SG take.PFV.3SG by the.F.SG head.F.SG and ACC.M.SG burn.PFV.3SG in ashes.F.PL with fire.M.SG blue.M.SC
'He took him by the head and burned him to cinders with a blue fire.' (GBooks)

- By combining the proposals made by both Talmy and Washio, we arrive at a typological classification where languages have a tendency to show variation with respect to whether they allow both strong and weak resultatives (Washio, 1997; Talmy, 2000; Beavers et al., 2010; Mateu, 2012; Acedo-Matellán, 2016):

  - Satellite-framed languages like English, German or Dutch, exhibit both strong and weak resultatives since strong result phrases can be expressed as satellites.
  - Verb-framed languages like Romance languages, Japanese, or Hebrew allow only weak resultatives while disallowing resultatives of the strong type.

- Given the classification of strong versus weak resultatives and the MRC directly determining the distribution of roots in event structures (e.g., Rappaport Hovav & Levin, 2010), an additional strong prediction arises: **strong resultatives should only ever be possible with manner roots**, while **result roots should only ever be possible with weak resultatives**.

- We observe that this prediction plays out differently across English and Spanish with respect to COS roots. In English, COS roots are not limited to expressing weak resultatives; for example, the verb *explode* can be used in both a strong (7a) and a weak resultative (7b) context.

(7) a. Then Desdemona **exploded** into a thousand bats and flew away. (GBooks)
b. My right passenger window suddenly **exploded** into pieces while driving. (Web)

strong (2012) calls cognate resultatives, e.g., *limpiarlo bien limpiado* lit. 'clean it well cleaned' (see also Demonte, 1991). This class of resultatives are special in that they appear to require root identity between the main verb and the adjective as well as a degree adverb or reduplication of the adjective (cf. *limpiarlo *(bien) limpiado*). We set this class aside as it is not relevant for present purposes since these resultatives do not involve a strong resultative configuration, but constitute a subtype of extremely weak resultatives with an adverbial flavor as they appear to pattern like pseduoresultatives of the *cut the meat thin/thinly* type, as discussed by Espinal & Mateu (2018) in detail for Catalan.

- This compatibility of COS with both strong and weak resultative behavior is not an idiosyncrasy of *explode*; other COS verbs, such as *break*, *melt* or *tear*, show the same flexibility (e.g., Yu et al., 2023).

(8) a. A couple of monks **broke** the corpse loose from the deck$_{AP}$. (COCA) STRONG
b. John **broke** the vase in half. WEAK

(9) a. [...] the way she heals up after **tearing** her skin open$_{AP}$. (COCA) STRONG
b. Search for documents that have been **torn** into pieces. (GBooks) WEAK

(10) a. Scientists just **melted** a hole$_{DP}$ through 3,500 feet of ice. (Web) STRONG
b. Forces get dissolved and **melted** into a single mass. (GBooks) WEAK

- The flexibility observed with English COS roots, however, is not observed with their Spanish counterparts: a phrase that cannot be construed as modifying the result in the verb leads to ungrammaticality (11) (further see the contrasts above regarding (5) and (6)) (Mateu, 2002, 2012; Acedo-Matellán & Mateu, 2013, 2015; Acedo-Matellán, 2010, 2016; Bigolin & Ausensi, 2021; McNally & Spalek, 2022)

(11) a. Justo antes de que el avión **explote** en mil
just before of that the.M.SG plane.M.SG explode.SBJV.PRS.3SG in thousand
pedazos.
pieces.F.PL
'Just before the plane explodes into a thousand pieces.' (Gbooks) WEAK
b. *Desdemona **explotó** en mil murciélagos.
Desdemona explode.PFV.3SG in thousand bats.M.PL
Intended: 'Desdemona exploded into a thousand bats.' STRONG

- The major question to ask then is: given that COS roots are by definition result roots, what is responsible for their differing behavior across English and Spanish with respect to forming strong and weak resultatives, such that these roots seem to conform to MRC in Spanish but not in English?

3 Proposal

- We propose that English and Spanish **differ systematically in their lexical inventories**, specifically in the lexical semantics of the individual items involved.
  - **COS roots in English systematically differ in their lexical semantics from their Spanish counterparts**. English COS roots are *eventive*, while in Spanish they are *stative*. This difference determines in turn how they are integrated into a resultative event structure.
  - English and Spanish **differ in their inventory of available prepositions**, specifically those encoding paths along which change occurs.

3.1 Two Points of Variation between English and Spanish

- **The first point of variation** concerns the semantics and type-theoretic properties of COS roots in these two languages.
- We propose that COS roots entail change in both languages but differ in their type-theoretic properties (Beavers & Koontz-Garboden, 2020).
- English COS roots denote **relations between individuals and events**, such that the event causes a state named by the root (12), using $\sqrt{\text{EXPLODE}}$ as an example and representing change using the BECOME relation (Dowty, 1979).

(12) $[\![\sqrt{\text{EXPLODE}}]\!]$: $\lambda x.\lambda e.\exists s[\text{BECOME}(e,s) \wedge \text{EXPLODED}(x,s)]$

- On the other hand, we propose that translationally equivalent roots in Spanish, e.g. $\sqrt{\text{EXPLOT-}}$ 'explode,' denote **relations between an individual and a state**, while specifying that such a state must be the consequence of a previous event (13).[3]

(13) $[\![\sqrt{\text{EXPLOT-}}]\!]$: $\lambda x.\lambda s.\text{EXPLODED}(x,s) \wedge \exists e[\text{BECOME}(e,s)]$

- Ultimately, this amounts to the same contribution to the truth-conditions: an event of change leads to a result state named by the root.
- However, the type-theoretic properties of COS roots differ between the two languages, and consequently they differ in their compositional properties, and therefore their ability to be intergrated into different event structures. This will be key in explaining the (in)ability of COS roots to form strong and weak resultatives in each language.
- **The second point of variation** concerns the types of prepositions available in each language, since these can function as the heads of PPs serving as result phrases, e.g., *hammer the metal into the ground*.
- Verb-framed languages such as Spanish have been observed to lack eventive, path-characterizing prepositions equivalent to the English *to*, and thus only have stative ones with locative meanings, such as Spanish *a* 'at' (Song, 1997; Folli & Ramchand, 2005; Fábregas, 2007; Gehrke, 2008; Beavers et al., 2010).
- Although these stative prepositions are compatible with directional semantics, such a resultative interpretation is only possible when a stative preposition is combined with a main verb that encodes direction by itself (14) (from CREA) (Beavers et al., 2010).

[3] Beavers & Koontz-Garboden originally analyze COS roots as predicates of states entailing change, i.e., in effective the analysis that we argue Spanish result roots involve. As will become clearer in the discussion to follow, we show there is strong evidence that supports the distinct type-theoretic properties of COS roots in English and Spanish. An approach that analyzes English COS roots as predicates of states would struggle in accounting for the fact that this class of verbal roots in this language appear in both a weak and a strong resultative context, i.e., English result roots can be modifiers of an event structure template (Yu et al., 2023).

(14) a. Las chicas **fueron** a la casa de la abuela de
the.F.PL girl.F.PL go.PFV.3PL to the.F.SG house.F.SG of the.F.SG grandmother.F.SG of
Begoña.
Begoña
'The girls went to Begoña's grandmother's house.'

b. Tres hombres **entraron** a la tienda.
three man.M.PL enter.PFV.3PL to the.F.SG shop.F.SG
'Three men entered the shop.'

c. Más de dos millones de alumnos **volvieron** a las
more than two million.M.PL of student.M.PL return.PFV.3PL to the.F.PL
aulas.
classroom.F.PL
'More than two millions of students returned to school.'

- If the verb in question does not encode directed motion, but simply a manner of motion, e.g., *bailar* 'dance', *nadar* 'swim' and *gatear* 'crawl' in (15), the stative preposition *a* is not capable of introducing directional semantics on its own (Beavers et al., 2010).[4]

(15) a. *Los niños **bailaron** a la sala.
the.M.PL children.M.PL dance.PFV.3PL to the.F.SG room.F.SG
Intended: 'The kids danced to the room.'

b. *El surfero **nadó** a las rocas.
the.M.SG surfer.M.SG swim.PFV.3SG to the.F.PL rock.F.PL
Intended: 'The surfer swam to the rocks.'

c. *El bebé **gateó** a la puerta.
the.M.SG baby.M.SG crawl.PFV.3SG to the.F.SG door.F.SG
Intended: 'The baby crawled to the door.'

- The non-existence of such path-characterizing prepositions in Romance languages naturally correlates with the unavailability of resultatives of the strong type and in turn, with variation regarding Talmy's typology (Aske, 1989; Talmy, 1991, 2000; Napoli, 1992; Song, 1997; Washio, 1997; Folli & Ramchand, 2005; Gehrke, 2008).

- By contrast, English PPs of the *into pieces* or *to the side* type are eventive, as they contribute change of state or location (16a). For example, *into* is clearly decomposable into *to*, which characterizes a

[4]Some Romance manner of motion verbs have been observed to occur in a directed motion event, where *a* allegedly would introduce directional semantics, parallel to the English examples *The kid ran in the room*, which are compatible with a directional reading despite containing the locative preposition *in*. For instance, Fábregas (2007); Folli & Ramchand (2005); Mateu (2012) note that Spanish verbs of the *fly* or *run* sort can combine with *a* expressing directional semantics, e.g., *Juan corrió al hospital* 'John ran to the hospital'. These verbs, however, have been argued to encode direction, in addition to manner, hence explaining why they can express directional semantics in combination with locative prepositions of the *a* type. As illustrated above for (15), manner of motion verbs in Spanish that do not encode any direction cannot express directional readings when combined with *a*. Similarly, Beavers et al. (2010) argue that the directional interpretation of stative prepositions such as *a* in Spanish or *in* in English is due to a pragmatic inference, since it is only possible in specific contexts and with specific verbs. Namely, while English examples involving manner of motion verbs of the *run* sort as in *John ran in the room* are ambiguous between a directional and locative interpretation, pure manner of motion verbs like *dance* as in *John danced in the room* are only compatible with a locative reading.

path of change, and *in* expressing the endpoint of the path (e.g., Svenonius, 2010).

- Again taking the presence of BECOME to indicate an event of change, we provide the semantics of PPs in English and Spanish in (16a) and (16b) respectively, where the former is a predicate of events after taking an individual argument, whereas the latter returns a predicate of states.

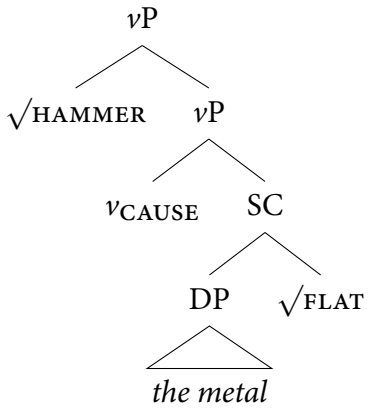
(16) a. $[\![x \textit{ into pieces}]\!]$: $\lambda e.\exists s[\textsc{become}(e,s) \wedge \textsc{in-pieces}(x,s)]$
b. $[\![x \textit{ en pedazos}]\!]$: $\lambda s.\textsc{in-pieces}(x,s)$

3.2 Integrating COS Roots

- We assume a syntactic event structure template of resultative constructions that involves a little *v* head encoding causation, with a small clause XP as complement (e.g., Hoekstra, 1988; Folli & Harley, 2005; Kratzer, 2005; Mateu, 2012; Beavers & Koontz-Garboden, 2020).

- Resultatives are therefore on par with lexical causative verbs, the sole difference being that *v*P is modified directly by a root, whereas lexical causatives involve incorporation of a root into *v* (e.g., Harley, 2005).

(17) Mary hammered the metal flat.



- The locus of causation, little *v*, is assumed to take a constituent denoting a predicate of eventualities (either events or states) as argument, while introducing a causative relation between an event and this argument, leading to a resultative meaning (Kratzer, 2005).

(18) $[\![v_{\textsc{cause}}]\!]$: $\lambda P_{v,t}.\lambda e.\exists e'[\textsc{cause}(e,e') \wedge P(e')]$

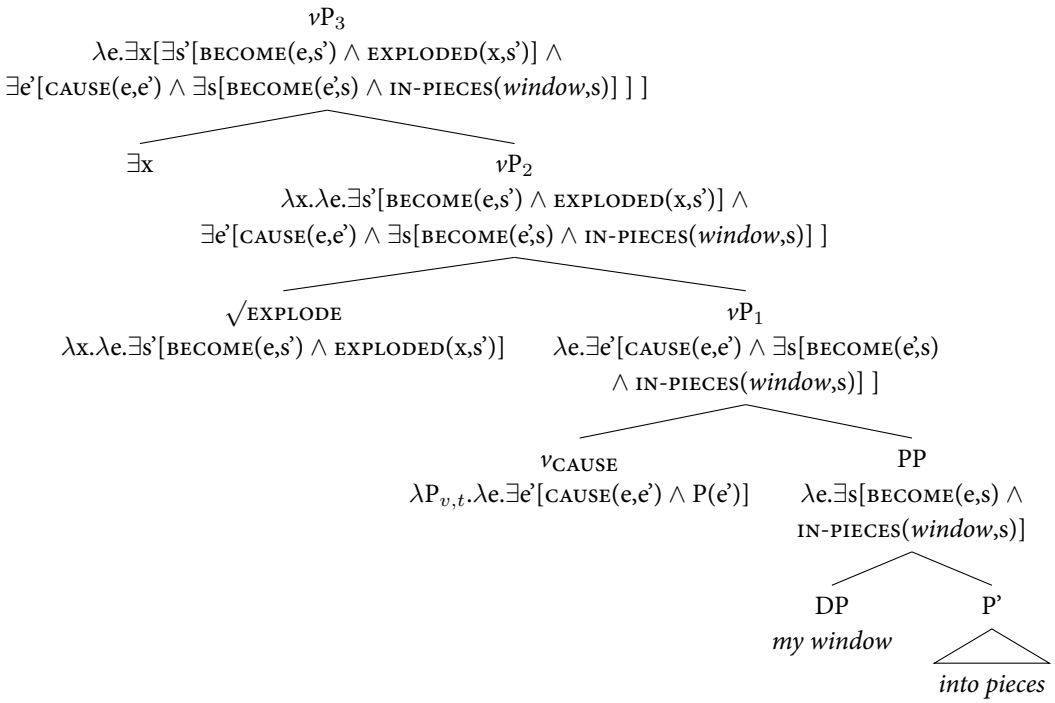
- Manner roots forming verbs like *hammer*, if taken to simply denote predicates of events (e.g., Embick 2009), directly modify the entire *v*P via a compositional rule like generalized PREDICATE MODIFICATION (Heim & Kratzer, 1998), thereby providing a manner specification to the causing event.

- Against that backdrop, we can now see how COS roots are integrated into a resultative event structure template differently across English and Spanish.

- Since an English COS root like $\sqrt{\text{EXPLODE}}$ is an eventive predicate of type $<e,<v,t>>$, it is integrated into the event structure as modifier of the entire *v*P when there is an eventuality-characterizing constituent serving as complement of v_{CAUSE}.

- These two expressions compose by the compositional rule EVENT IDENTIFICATION (Kratzer, 1996), which combines functions of type $<e,<v,t>>$ and $<v,t>$, and returns a function from individuals to predicates of events where the event descriptions of the two input functions are logically conjoined.[5]

(19) English: *x explode into pieces* ≈ (7b)



- A key feature of the analysis of English COS roots in resultative event structures: the state variable of the result root and that of the result PP are **existentially quantified separately**, leading to a weak interpretation regarding the identity of these two state variables.

- This means there two ways to resolve the reference of the state variables that satisfy the truth conditions of existential quantification.

- The first is if the two state variables are construed as referring to the same state. In such a situation, **the state descriptions predicated of this same state must be conceptually compatible, i.e. their intersection must be non-empty**. This essentially leads to a **weak resultative interpretation**, as previously illustrated by the examples in (4), which we repeat below for convenience.

- These examples most naturally involve a weak resultative interpretation because the two state variables are naturally construed as referring to the same state. Namely, in (20a) the result PP *to ashes* describes a change into a state of being ash, which is naturally identified with the state of being burnt introduced by the main verb *burn*.

[5] We further assume that to compose with an external argument-introducing head like VOICE, a rule like EXISTENTIAL CLOSURE applies at the *v*P level to produce an event predicate (Alexiadou et al., 2014).

- In other words, just as a state of being exploded can also be a state of being in pieces, a state of being burnt can also be a state of being in an ashen form. Similar comments apply to the other examples below.

(20) a. The East Village is going to be **burned** to ashes.
b. Lake Erie was **frozen** solid.
c. The last bite of ice cream has **melted** into a puddle the size of a teardrop.
d. The window trims he **painted** white and the front door red.

- If, on the other hand, the state variables are construed as referring to *distinct states*, **the two state descriptions the variables are predicated of can be different, incompatible properties, leading to a strong resultative interpretation**, as previously illustrated in (8)-(10). Additional examples are provided below.

- For instance, in (21b) the two state descriptions are naturally interpreted as applying to different states with *distinct holders*. This is because some part of the skin becomes ripped, but it is the referent of the direct object that undergoes the change of location introduced by the particle *out*.

(21) a. The methods of obtaining blocks involve first isolating them by cutting narrow trenches then **splitting** them free from the bed. (Web)
b. I could **rip** your throat out if I wanted.[6]
c. Hurricane Sandy **tore** a path through the Northeast yesterday. (COCA)
d. A lot of the water sprayed onto the ship had **frozen** onto the steel. (GloWbE)

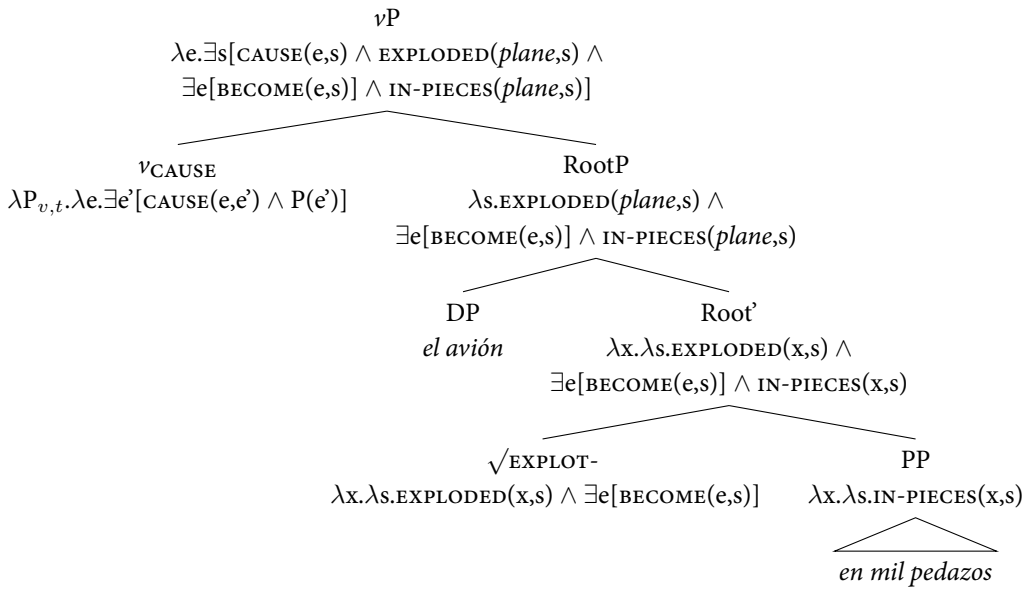
- Moving on to Spanish, recall our proposal that COS roots in the language are stative rather than eventive, as in (13). This means that unlike English, COS roots cannot modify the entire *v*P as in (7b), since this constituent is eventive and an attempt at composition would result in a type-mismatch.

- Rather, the stative COS root must be integrated as the complement of v_{CAUSE}, since it takes either eventive or stative constituents as its first argument and introduces a causal relation between an event and the eventuality contributed by this first argument.

- In the presence of an added PP, which was shown previously to always be stative, e.g., (16b), the root combines first with the PP via Predicate Modification, ensuring that it shares an argument with the PP. The entire stative constituent then serves as the argument of v_{CAUSE} and therefore is interpreted as being the result of a causing event.

[6] *Locke and Key*, Season 2, Episode 10: https://tvshowtranscripts.ourboard.org/viewtopic.php?f=1094&t=47202)

(22) Spanish: *explotar en mil pedazos* ≈ (11a)



- Note now a key difference between English and Spanish: in Spanish, the state variables of the COS root and PP are **bound by the same existential quantifier**. This means that Spanish does not have any flexibility in terms of interpreting the state entailed by the root; it must always be identical to the state denoted by the PP.
- Consequently, this requires that the two state descriptions always be predicated of the same state, and thus they must always be compatible properties. PPs that do not satisfy this semantic constraint, even if headed by the same preposition, are infelicitous.
- This was previously illustrated in (11) in which the same preposition *en* 'in' is involved in both examples, yet only the one in a weak resultative context is felicitous in Spanish. We repeat the relevant examples below.

(23) a. Justo antes de que el avión **explote** en mil pedazos.
just before of that the.M.SG plane.M.SG explode.SBJV.PRS.3SG in thousand pieces.F.PL
'Just before the plane explodes into a thousand pieces.' (Gbooks)

b. *Desdemona **explotó** en mil murciélagos.
Desdemona explode.PFV.3SG in thousand bats.M.PL
Intended: 'Desdemona exploded into a thousand bats.'

- We provide additional examples illustrating this contrast for Spanish in (24); these are licit because they involve verbs built on COS roots and the result phrases are compatible with the state description introduced by the verb.

(24) a. El núcleo se **rompe** en dos o más fragmentos.
the.M.SG core.M.SG REFL break.PRS.3SG in two or more fragments.M.PL

'The core breaks into two or more fragments.' (CREA)

b. El soldadito lentamente se **derritió** en una masa sin
the.M.SG soldier.M.SG.DIM slowly REFL melt.PFV.3SG in a.F.SG mass.F.SG without
forma.
form.F.SG
'The little soldier slowly melted into a mass without shape.' (CES)

c. Observamos que [el agua] se **congeló** en una masa
observe.PFV.1PL that the.F.SG water.F.SG REFL freeze.PFV.3SG in a.F.SG mass.F.SG
sólida y cristalina.
solid.F.SG and crystalline.F.SG
'We observed that the water froze into a solid and crystalline mass.' (Web)

- In contrast, the examples in (25) show that Spanish translational equivalents of the English examples in strong resultative contexts are not possible configurations for describing such resultative events, even if the same preposition heads the resultative PP.[7]

(25) a. #Él **rompió** los huevos en/al vaso.
he break.PFV.3SG the.M.PL egg.M.PL in/at.the.M.PL vase.M.SG
Intended: 'He broke the eggs into the glass.' (Levin & Rappaport Hovav, 1995: 60-61)

b. #El chocolate se **derritió** en/a la alfombra.
the.M.SG chocolate.M.SG REFL melt.PFV.3SG in/at the.F.SG rug.F.SG
Intended: 'The chocolate melted onto the carpet.' (based on Goldberg & Jackendoff, 2004: 551)

c. *Hacía tanto frío que los engranajes de sus vehículos y
do.IPFV.3SG so cold that the.M.PL gears.M.PL of their vehicles.M.PL and
armas se **congelaron** en/a inutilidad.
weapons.M.PL REFL freeze.PFV.3PL in/at uselessness
Intended: 'It was so cold that the gears of their vehicles and weapons froze into uselessness.' (GBooks)

- A second piece of independent evidence for analyzing English and Spanish COS roots and their integration into a resultative event structure differently comes from the availability of different parts of the event structure for modification by presupposition triggers like *again* and the Spanish equivalent *otra vez*.

- Recall that we assume English PPs like *into* are decomposable, consisting of a directional and a stative preposition (Svenonius, 2010; Mateu, 2012; Acedo-Matellán, 2016). Furthermore, note that the entire PP constituent in (19) is taken as argument by v_{CAUSE} independently of the COS root that adjoins structurally higher.

- This means that modifiers of the right type should be able to independently modify, e.g., the stative component headed by *in* in *into*. One modifier that is known to be able to attach at different

[7] Note that we mark some examples that are ruled out in Spanish with # instead of the typical marker of ungrammaticality *. This is due to the fact that examples like *Juan rompió el huevo en el vaso* are perfectly fine under a locative interpretation of the PP, i.e., the breaking of the egg is carried out inside the glass.

points within a structure is the presupposition trigger *again*, famously known to lead to repetitive-restitutive ambiguities.

- *Again* is an event predicate modifier of type $<<v,t>,<v,t>>$, introducing an identity function over event predicates in the assertion and a presupposition that an eventuality of the same type as its complement happened previously (e.g., von Stechow, 1996; Beck & Johnson, 2004). When attached to an eventive constituent, *again* produces a repetitive interpretation, but when attached to a stative constituent, it produces a restitutive presupposition.

- The Spanish equivalent *otra vez* has also been noted to display the same sort of structural repetitive-restitutive ambiguity (Cuervo, 2014).

- The analyses of COS roots and their event structural integration in English versus Spanish in (19) and (22) make predictions about the kinds of readings available with *again*-like modifiers.

- In English, *again* should be able to target the stative constituent headed by the stative part of *into*, presupposing that this state held previously independent of the way this state was brought about.

- By contrast, in Spanish, *otra vez* should not be able to target the stative component introduced by prepositions of the *en* sort independent of an event of change, because the state variable predicated of the PP shares an argument with and is identified with that of the COS root which entails change. *Otra vez* can only attach after this shared argument is introduced, i.e., RootP in (22), in which the event of change introduced by the COS root is always included.

- In other words, *again* in English should be able to produce a purely restitutive presupposition with resultatives built out of COS roots, whereas in Spanish such stative presuppositions are expected to be excluded and only repetitive presuppositions are possible.

- This is indeed borne out, as shown in (26)-(27).

(26) CONTEXT: A plate was manufactured in ten separate pieces. Juan bought it and put the pieces together, making the plate whole. While he managed to use it for a long time, one day he dropped it on the ground, breaking it into its ten component pieces.

a. The plate broke into ten pieces again.
b. # El plato se rompió en diez pedazos otra vez.

(27) CONTEXT: A solid chunk of earth has always existed, but it was heated up by a crazy scientist, and melted into lava. Another crazy scientist came and blasted it with liquid nitrogen, freezing it into a solid mass.

a. The chunk of earth froze into a solid mass again.
b. # El trozo de tierra se congeló en una masa sólida otra vez.

- This evidence thus supports a view where translationally equivalent COS roots in English and Spanish do not share the same lexical semantic properties and are integrated into event structures differently.

4 Conclusion

- We formalized the observation that English appears to allow both strong and weak resultatives, while Spanish allows only resultatives of the weak type with COS roots.
- In particular, we appealed to differences in the semantics and type-theoretic properties of the inventory of verbal roots and prepositions in English and Spanish.
- On our account, the fact that COS roots form both strong and weak resultatives in English but only weak resultatives in Spanish falls out from their different type-theoretic properties, which directly affects how they are integrated into a resultative event structure across the two languages.
- We explain differences between these two languages regarding argument structure patterns without stipulating that the effects of Talmy's typology are reduced to a syntactic deficiency of verb-framed languages, according to which they lack the syntactic operation that builds resultatives of the strong type (Mateu, 2002, 2012; Real-Puigdollers, 2013; Acedo-Matellán & Mateu, 2013; Bigolin & Ausensi, 2021) (see appendix for discussion).
- Our account ultimately adds evidence to and supports the view that the effects of Talmy's typology can be reduced to and explained by considering the grammatical properties languages have available in order to express resultative events of change (Beavers et al., 2010).
- Variation regarding the expression of resultativity across languages thus arises from the fact that language families do not have the same grammatical options available to them, e.g., the availability (as in satellite-framed languages) or lack (as in verb-framed languages) of prepositions encoding resultative semantics such as English *to*, as well as independent differences between languages in the lexical semantics of root classes even if they express the same real-world concept.
- The proposed analysis also has implications for proposed constraints on verbal meaning like the MRC (Rappaport Hovav & Levin, 2010). Specifically, the analysis proposed here suggests that COS roots, which do entail result, need not necessarily map to specific syntactic event structure positions like complement of eventive little *v* heads in syntactic approaches to implementing the MRC (e.g., most recently in Folli & Harley, 2020).
- Rather, it is the type-theoretic properties of roots that determine how they are integrated into event structure templates independent of whether they entail manner or result, with consequent grammatical properties such as the possibility of strong versus weak resultatives emerging from such integration (Yu et al., 2023).

Acknowledgments: Ausensi is supported by the fellowship Juan de la Cierva–Formación FJC2021-046652-I (MCIN/AEI/10.13039/501100011033) and NextGenerationEU/PRTR, Smith by ERC-2017-COG769192 awarded to Andrew Koontz-Garboden, and Yu by the KU Leuven-funded C1-project Comparatives Under the Microscope (C14/20/041) awarded to Jeroen van Craenenbroeck, Guido Vanden Wyngaerd, and Dany Jaspers.

References

Acedo-Matellán, Víctor. 2010. *Argument Structure and the Syntax-Morphology Interface. A case study in Latin and Other Languages*: Universitat Autònoma de Barcelona dissertation.

Acedo-Matellán, Víctor. 2016. *The morphosyntax of transitions: A case study in Latin and other languages*. Oxford: Oxford University Press.

Acedo-Matellán, Víctor & Jaume Mateu. 2013. Satellite-framed latin vs. verb-framed romance: A syntactic approach. *Probus: International Journal of Latin and Romance Linguistics* 25(2). 227–265.

Acedo-Matellán, Víctor & Jaume Mateu. 2015. Parameters and argument structure i: Motion predicates and resultatives. In Antonio Fábregas, Jaume Mateu & Putnam Michael (eds.), *Contemporary Linguistic Parameters*, 99–112. London, New York: Bloomsbury Academic.

Alexiadou, Artemis, Florian Schäfer & Giorgos Spathas. 2014. Delimiting voice in Germanic: On object drop and naturally reflexive verbs. In Jyoti Iyer & Leland Kusmer (eds.), *Proceedings of the 44th Meeting of the North East Linguistic Society*, 1–14. Amherst, MA: GLSA.

Armstrong, Grant. 2012. On the adjectival component of change of state verbs in Spanish. In *The end of argument structure?*, 13–41. Bingley: Emerald.

Aske, Jon. 1989. Path predicates in English and Spanish: A closer look. In *Proceedings of the Fifteenth Annual Meeting of the Berkeley Linguistics Society*, 1–14.

Beavers, John & Andrew Koontz-Garboden. 2020. *The roots of verbal meaning*. Oxford: Oxford University Press.

Beavers, John, Beth Levin & Shiao Wei Tham. 2010. The typology of motion expressions revisited. *Journal of Linguistics* 46. 331–377.

Beck, Sigrid & Kyle Johnson. 2004. Double objects again. *Linguistic Inquiry* 35(1). 97–123.

Bigolin, Alessandro & Josep Ausensi. 2021. A new resultative construction in Spanish? A reply to Rodríguez Arrizabalaga. *Folia Linguistica* 55(2). 517–546.

Cuervo, Mariá C. 2014. Alternating unaccusatives and the distribution of roots. *Lingua* 141. 48–70.

Davies, Mark. 2002. Corpus del español (100 millones de palabras, 1200s-1900s). Available online at https://www.corpusdelespanol.org/hist-gen/.

Davies, Mark. 2008. The Corpus of Contemporary American English: 450 million words, 1990-present. Available online at https://www.english-corpora.org/coca/.

Davies, Mark. 2013. Corpus of Global Web-Based English: 1.9 billion words from speakers in 20 countries. Available online at https://www.english-corpora.org/glowbe/.

Demonte, Violeta. 1991. Temporal and aspectual constraints on predicative aps. In Héctor Campos & F. Martínez-Gil (eds.), *Current Studies in Spanish Linguistics*, 165–200. Washington, DC: Georgetown University Press.

Dowty, David. 1979. *Word meaning and montague grammar*. Dordrecht: D. Reidel Publishing.

Embick, David. 2009. Roots, states, stative passives. Talk given at the 2009 Roots Workshop, University of Stuttgart, .

Espinal, M. Teresa & Jaume Mateu. 2018. Manner and result modifiers. the V *ben* V construction in Catalan. *The Linguistic Review* 35(1). 1–13.

Fábregas, Antonio. 2007. The exhaustive lexicalisation principle. *Nordlyd: Tromsø Working Papers in Linguistics* 34(2). 165–199.

Folli, Raffaella & Heidi Harley. 2005. Flavors of *v*. In Paula Marie Kempchinsky & Roumyana Slabakova

(eds.), *Aspectual inquiries*, 99–120. Springer, Dordrecht.

Folli, Raffaella & Heidi Harley. 2020. A head movement approach to Talmy's typology. *Linguistic Inquiry* 51(3). 425–470.

Folli, Raffaella & Gillian Ramchand. 2005. Prepositions and results in Italian and English: An analysis from event decomposition. In Henk Verkuyl, Henriëtte de Swart & Angelika van Hout (eds.), *Perspectives on aspect*, 81–105. Kluwer: Dordrecht.

Gehrke, Berit. 2008. *Ps in motion: On the semantics and syntax of p elements and motion events*: LOT Dissertation Series, Netherlands Graduate School of Linguistics dissertation.

Goldberg, Adele & Ray Jackendoff. 2004. The English resultative as a family of constructions. *Language* 80(3). 532–568.

Harley, Heidi. 2005. How do verbs get their names? Denominal verbs, manner incorporation, and the ontology of verb roots in English. In Nomi Erteschik-Shir & Tova Rapaport (eds.), *The syntax of aspect: Deriving thematic and aspectual interpretation*, 42–64. New York: Oxford University Press.

Heim, Irene & Angelika Kratzer. 1998. *Semantics in generative grammar*. Blackwell.

Hoekstra, Teun. 1988. Small clause results. *Lingua* 74(2-3). 101–139.

Kratzer, Angelika. 1996. Severing the external argument from its verbs. In Laurie Ann Zaring & Johan Rooryck (eds.), *Phrase structure and the lexicon*, 109–137. Kluwer, Dordrecht.

Kratzer, Angelika. 2005. Building resultatives. In Claudia Maienborn & Wöllstein-Leisten (eds.), *Event arguments: Functions and applications*, 177–212. Tübingen: Niemeyer.

Levin, Beth. 1993. *English verb classes and alternations: a preliminary investigation*. Chicago: University of Chicago Press.

Levin, Beth & Malka Rappaport Hovav. 1991. Wiping the slate clean: a lexical semantic exploration. *Cognition* 41(1-3). 123–151.

Levin, Beth & Malka Rappaport Hovav. 1995. *Unaccusativity: At the syntax-lexical semantics interface*. MIT press.

Mateu, Jaume. 2002. *Argument Structure: Relational Construal at the Syntax-semantics Interface*: Universitat Autònoma de Barcelona dissertation.

Mateu, Jaume. 2012. Conflation and incorporation processes in resultative constructions. In Violeta Demonte & Louise McNally (eds.), *Telicity, change, and state: A cross-categorial view of event structure*, 252–278. Oxford: Oxford University Press.

Mateu, Jaume. 2017. Two types of locative alternation. In Albert Álvarez & Ía Navarro (eds.), *Verb valency changes. theoretical and typological perspectives. typological studies in language*, 51–79. Amsterdam and Philedelphia: John Benjamins.

Mateu, Jaume & Víctor Acedo-Matellán. 2012. The manner/result complementarity revisited: A syntactic approach. In M. Cristina Cuervo & Yves Roberge (eds.), *The End of Argument Structure? Syntax and Semantics*, 209–228. New York: Academic Press.

Mateu, Jaume & Gemma Rigau. 2010. Verb-particle constructions in romance: A lexical-syntactic account. *Probus: International Journal of Latin and Romance Linguistics* 22. 241–69.

McNally, Louise & Alexandra Spalek. 2022. Grammatically relevant aspects of meaning and verbal polysemy. *Linguistics* .

Napoli, Donna Jo. 1992. Secondary resultative predicates in italian. *Journal of Linguistics* 28(1). 53–90.

Rappaport Hovav, Malka. 2008. Lexicalized meaning and the internal structure of events. In Susan Roth-

stein (ed.), *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect*, 13–42. Amsterdam: John Benjamin.

Rappaport Hovav, Malka & Beth Levin. 2010. Reflections on manner/result complementarity. In Malka Rappaport Hovav, Edit Doron & Ivy Sichel (eds.), *Syntax, Lexical Semantics, and Event Structure*, 21–38. Oxford: Oxford University Press.

Real Academia Española, RAE. N.D. Banco de datos CREA. Corpus de referencia del español actual. Available online at http://corpus.rae.es/creanet.html.

Real-Puigdollers, Cristina. 2010. A microparametric approach on goal of motion constructions: properties of adpositional systems in romance and germanic. *Catalan Journal of Linguistics* 9(1). 125–150.

Real-Puigdollers, Cristina. 2013. *Lexicalization by phase: The role of prepositions in argument structure and its cross-linguistic variation*: Universitat Autònoma de Barcelona dissertation.

Song, Grace. 1997. *Cross-linguistic differences in the expression of motion events and their implications for second language acquisition*: Northwestern University dissertation.

von Stechow, Arnim. 1996. The different readings of wieder 'again': A structural account. *Journal of Semantics* 13(2). 87–138.

Svenonius, Peter. 2010. Spatial P in English. In Guglielmo Cinque & Luigi Rizzi (eds.), *Mapping spatial PPs. The cartograhpy of syntactic structures*, 127–160. Oxford: Oxford University Press.

Talmy, Leonard. 1975. Semantics and syntax of motion. In John P. Kimball (ed.), *Syntax and semantics*, vol. 4, 181–238. New York, NY: Academic Press.

Talmy, Leonard. 1991. Path to realization - via aspect and result. In *Berkeley linguistics society (BLS) 17*, 480–519.

Talmy, Leonard. 2000. *Toward a cognitive semantics*. Cambridge, MA: MIT Press.

Washio, Ryuichi. 1997. Resultatives, compositionality, and language variation. *Journal of East Asian Linguistics* 6. 1–49.

Yu, Jianrong. 2020. *Repetitive and restitutive presuppositions and the semantics of English verbal roots*. Tucson, AZ: The University of Arizona dissertation.

Yu, Jianrong, Josep Ausensi & Ryan Walter Smith. 2023. States and changes-of-state in the semantics of result roots: Evidence from resultative constructions. *Natural Language and Linguistic Theory* .

Appendix

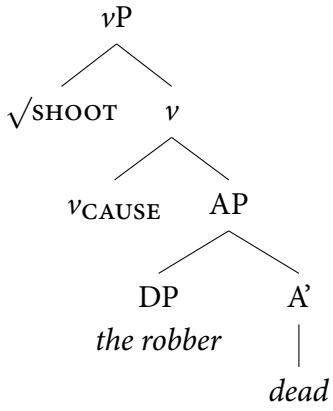
Alternative Analyses

- Syntactic approaches to the typology have defended the idea that variation regarding the satellite/verb-framed distinction across languages can be explained by appealing to a syntactic deficiency of verb-framed languages with regards to their inventory of functional heads or whether verb-framed languages lack a specific syntactic operation that builds resultatives of the strong type.

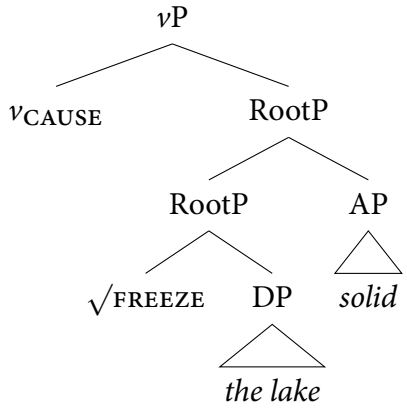
- For instance, Real-Puigdollers (2010, 2013) argues that in verb-framed languages such as Spanish, Path, i.e., the functional head responsible for expressing the result of the event, is defective as it needs to be expressed together with *v*.

- This syntactic deficiency of verb-framed languages regarding Path therefore makes it impossible for *v* to introduce the manner of the event.
- In contrast, in satellite-framed languages, Path is not subject to the same deficiency of verb-framed languages as it can be expressed independently of *v*, and *v* can then express the manner of the event.
- Mateu together with his colleagues (Acedo-Matellán & Mateu, 2013; Mateu, 2002, 2012, 2017; Mateu & Rigau, 2010) propose a similar constraint along the same lines.
- Their constraint basically boils to explaining the effects of Talmy's typology to the (un)availability of the syntactic operation responsible for the building up of resultative constructions in which the main verb encodes the manner, and the result is expressed outside the verb.
- The essence of their proposal relates to claiming that verb-framed languages such as Spanish lack the so-called syntactic operation of root adjunction to *v*, i.e., the syntactic position whereby verbal roots are structurally interpreted as providing the manner to the event, e.g., a strong resultative context, as illustrated below in (28).
- Verb-framed languages, on this view, only allow the configuration in (29) for resultatives, i.e., a weak resultative context.

(28) The FBI shot the robber dead.



(29) The lake froze solid.



- The contrast between English and Spanish reduces then to a more general lack of strong resultatives in Spanish because this language lacks *v*-adjunction.
- However, such an analysis does not obviously extend to resultatives with √EXPLODE-class roots. The sentences in (7) and (11), repeated below, make use of the same predicate and preposition with no motivated syntactic differences between sentences contrasting in acceptability.

(30) a. Then Desdemona exploded into a thousand bats and flew away.
b. My right passenger window suddenly exploded into pieces while driving.

(31) a. Justo antes de que el avión explote en mil
just before of that the.M.SG plane.M.SG explode.SBJV.PRS.3SG in thousand
pedazos.
pieces.F.PL

'Just before the plane explodes into a thousand pieces.'

b. *Desdemona explotó en mil murciélagos.
Desdemona explode.PFV.3SG in thousand bats.M.PL
Intended: 'Desdemona exploded into a thousand bats.'

- A syntactic analysis relying on the lack of *v*-adjunction in Spanish is not explicit about the contrasts above in particular and needs to be enriched with an account of the compatibility of the PP with the root, as we propose here.
- Namely, such accounts are not explicit about the nature of semantic composition, or what it means to be a manner vs. a result modifier, and therefore cannot claim to present an account of phenomena where such distinctions are crucial.
- Our own analysis, on the other hand, does not rely on putative differences in syntactic structure within a language, and yet provides an explicit account of meaning distinctions relevant to the range of possible resultatives within each language.
- In the same vein, Folli & Harley (2020) note that in principle the syntactic operation of root adjunction to *v* should be available to all languages, and not exclusive to satellite-framed ones.
- They note that a lack of *v*-adjunction as a syntactic operation explaining the lack of strong resultatives is also too strong, leading to consequences for other verb-types.
- For instance, Folli & Harley show that languages must be able to distinguish verb types since verbs of creation independently need *v*-adjunction.

(32) John weaved the tablecloth.

- Thus, approaches that suggest root adjunction to *v* is not available in verb-framed languages will predict no such verbs in the language, which is clearly undesirable.

Evidence for result roots entailing change within their lexical semantics

- Evidence for COS roots entailing change within their lexical semantics in both English and Spanish mainly comes from analyzing the interaction of this root class with sublexical modifiers such as *again*, which are widely known to be able to target specific subevents of an event structure (Dowty, 1979; von Stechow, 1996; Beck & Johnson, 2004).
- Namely, the presupposition trigger *again* generates an ambiguity between repetitive and restitutive readings in sentence-final position only when it modifies verbs built on roots that Beavers & Koontz-Garboden (2020) call property concept roots, i.e., roots that do not entail change within their lexical semantics. We illustrate below for the result verb *open*, built on the property concept root $\sqrt{\text{OPEN}}$.

(33) $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda x.\lambda s.\text{OPEN}(x,s)$

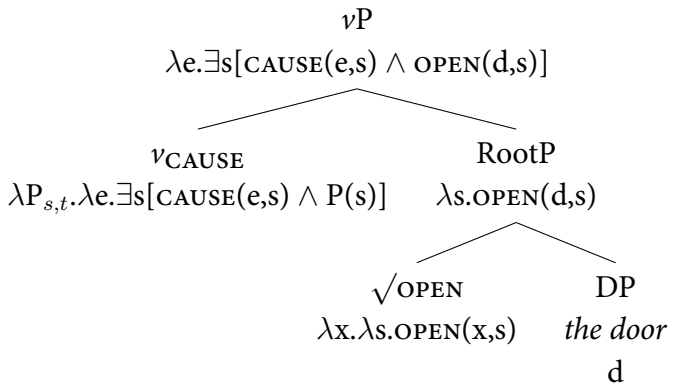
- Property concept roots form deadjectival result verbs such as *open*, *white* or *lengthen* etc. and do not lexically entail change as they denote relations between an individual and a state (Beavers & Koontz-Garboden, 2020). When property concept roots are modified by *again* in sentence-final position, *again* generates an ambiguity between a repetitive and a restitutive reading, illustrated below.

(34) John opened the door again.

a. John opened the door again, and it had been open before. (Restitutive)
b. John opened the door again, and it had opened before. (Repetitive)

- The restitutive reading thus involves restoration of a prior state with no entailment that there was a previous change that brought it about. This shows that *again* is able to target a stative constituent in the event structure that does not include change as part of its meaning, i.e., RootP in (35) below, therefore triggering a presupposition of a prior identical state.

(35) John opened the door.



- We further illustrate this by considering examples from Beavers & Koontz-Garboden (2020: 85) which include result verbs built on property concept roots such as *sharp*, *long* and *large* in contexts that explicitly rule out any repetitive reading.

(36) a. CONTEXT: John buys a knife that was forged in such a way that it was already sharp. John uses it until it becomes blunt. He uses a whetting stone to make it sharp once more.
John sharpened the knife again. (OK just one sharpening)

b. CONTEXT: A film producer makes a 4 hour long film, which is significantly longer than the norm. She is pressured to reduce its length, so cuts it to be two hours. But then the director and actors protest, so she restores it to 4 hours.
The producer lengthened the film again. (OK just one lengthening)

c. CONTEXT: Kim takes a photo that is too large to use as a Facebook profile photo. She shrinks it to a more appropriate size, but thinks it does not look good. So she restores it to its original size and puts it on her personal website instead.
Kim enlarged the photograph again. (OK just one enlarging)

- In contrast to property concept roots, COS roots in English and Spanish do not involve an independent constituent that does not entail change which *again* can target, giving rise to restitutive readings. This predicts that sublexical modifiers like *again* in either language should not generate ambiguities of the repetitive and restitutive sort when modifying result verbs built on COS roots.

- When modified with *again*, COS roots in both English and Spanish should always produce a repetitive presupposition, and never a restitutive one. We show this is borne out by considering examples from Beavers & Koontz-Garboden (2020: 85) and Yu (2020) (see also Rappaport Hovav, 2008).

(37) a. CONTEXT: Mary requested a potter to make a plate in separate pieces so she can practice her pottery-mending skills. She took a day to put the pieces together. John, who was secretly angry with Mary for previously breaking his favorite bowl, snatched the mended plate from and Mary broke it.
John broke the plate again. (necessarily two breakings)

b. CONTEXT: Leah kills a rabbit, takes it home and skins and butchers it and then puts the fresh meat in the freezer for three days. She then takes it out and puts it on the table to thaw.
Leah thawed the meat again. (necessarily two defrostings)

c. CONTEXT: An ice cream factory manufactures ice cream from a package of ingredients by adding water and then freezing the result. After adding the contents of the package to water and freezing it, Kim lets it melt into a liquid state.
Kim melted the ice cream again. (necessarily two meltings)

- Spanish COS roots show the same behavior in contexts that explicitly rule out a restitutive reading. We illustrate this below in the Spanish translational equivalents of the English contexts above with the result verbs which are built on COS roots *romper* 'break', *descongelar* 'thaw' and *derritir* 'melt'.

(38) a. CONTEXT: María le pidió a un alfarero que hiciera un plato en trozos separados para que pudiera practicar sus habilidades de reparación de cerámica. Le costó un dia poner todas las piezas juntas. Juan, el cual estaba enfadado en secreto con María por haberle roto su bol favorito, cogió el plato que María había reparado y lo rompió.
Juan rompió el plato otra vez. (necessarily two breakings)

b. CONTEXT: Lucía mata un conejo, se lo lleva a casa y lo pela y pone la carne fresca en el congelador durante tres días. Después de tres días, lo saca del congelador y lo pone en la mesa para que se descongele.
Lucía descongeló la carne otra vez. (necessarily two defrostings)

c. CONTEXT: Una empresa de helados fabrica helados añadiendo agua a un paquete de ingredientes y después lo congelan. Después de añadir agua al contenido del paquete y de congelarlo, Quim deja que se derrita hasta que se hace líquido.
Quim derritió el helado otra vez. (necessarily two meltings)