

Argument and Adjunct Coordination in Spanish

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1. A Puzzle: Spanish Coordination with(out) P Repetition

Spanish shows an interesting asymmetry in coordination strategies within PPs. Consider the following sentences:¹

- (1) a. Me caso con Juan o *(con) Pedro.
1SG.CL I.marry with Juan or with Pedro
“I will marry Juan or Pedro.”
b. Se puede pagar con tarjeta de crédito o ?(con) la app.
3.CL can pay with credit card or with the app
“One can pay by credit card or with the app.”

In some cases, repeating the preposition is obligatory, while not repeating it is ungrammatical, as in (1a). In other cases, such as (1b), both repeating and not repeating the preposition are possible (though repeating it is preferred, perhaps for prescriptive reasons). A Google search revealed naturally-occurring examples of the latter type without P repetition:

- (2) a. Si van a pagar con tarjeta de crédito o
if 3PL.go to pay with credit card or
cheque de viajero, cuénten=le al gerente.
traveler’s check 3PL.tell.SBJV=3SG.CL.DAT to the manager
“If you will be paying with a credit card or a traveler’s check, please inform the manager.”
(<https://www.lanacion.com.co/2016/03/18/policia-lanzo-plan-semana-santa-segura-y-en-paz/>)
b. Las perlas se pueden pegar con pegamento o cinta
the pearls 3.CL 3PL.can stick with glue or tape
adhesiva en las caras de distintas cajas.
adhesive on the faces of different boxes
“The pearls can be attached to the sides of different boxes with glue or tape.”
(<https://books.google.com/books?id=A4UzKRbLVioC&pg=PA161>)

¹The Spanish judgements we report were provided variously by Helena López Palma or Jorge Guzman, whom we thank for their assistance.

This differs from English, where not repeating P is always possible:

- (3) a. I dealt with the problem or (with) the solution.
b. You can pay with a credit card or (with) the app.
c. I want ice cream with strawberries or (with) raspberries.

An additional fact is that in (1a), the *con*-PP is an argument of the verb. When *casarse* takes an internal argument, it must be a *con*-PP:

- (4) a. *Me caso Juan.
1SG.CL I.marry Juan
b. *Me caso { a / por medio de / junto con } Juan.
1SG.CL I.marry to by means of together with Juan

The DP inside the *con*-PP also combines in a semantically idiosyncratic way with the verb; that is, *con* does not carry the meaning of comitativity, instrumenthood, etc. that it does when it introduces an adjunct, as in (1b).

The Proposal

Argument PPs are syntactically and semantically simple, while adjunct PPs are syntactically and semantically complex. Assuming a theory of coordination à la Partee & Rooth (1983), this can explain the contrast in (1).

Here’s an outline:

§2 We present our assumptions about coordination.

§3 We present the syntax and semantics of adjunct *con*-PPs.

§4 We present how to derive (1b) taking into account §2 & §3.

§5 We present how to derive (1a) and (3) taking into account §2 and the difference between pied-piping in English and Spanish.

2. A Quick Note on Coordination

As a baseline, we assume the following theory of coordination:

- Coordinators have one basic type: $\langle\langle s, t \rangle, \langle\langle s, t \rangle, \langle s, t \rangle\rangle\rangle$, where s is the type of events, and t the type of truth-values.
- Coordinators may conjoin other types by means of type-shifters. However, type-shifters are costly, and can only be used as a last resort (Partee & Rooth 1983).²

These two facts will create a strong preference for coordinators to operate on constituents of type $\langle s, t \rangle$ if this is possible (cf. Hirsch 2017).

In addition, we assume that there are two *ands* in English and two *y-es* in Spanish: one is the logical conjunction operator “ \wedge ” (as above). The other is a sum formation operator “ \oplus ,” which forms complex entities. To avoid the potential confounds of this existence of this homophonous sum formation operator, we use disjunction in our examples, for which no such confound exists.

3. Complex PPs

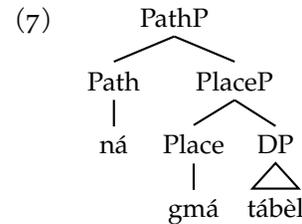
It has been widely noted that spatial prepositional phrases are internally complex, consisting of a number of distinguishable functional projections (Cinque & Rizzi 2010; Radkevich 2010; Roy & Svenonius 2009; Svenonius 2007, 2010, a.o.). An easy starting point to show this is a distinction between **Place** and **Path** PPs. The former specify the location of an object in a place, while the latter specify trajectories relative to a place.

- (5) a. The elephants remained **in** the boat. (Place)
 b. They cast a wistful glance **to** the shore. (Path_{GOAL})
 c. The boat drifted further **from** the beach. (Path_{SOURCE})
 d. Their ears sank **down** several notches. (Path_I)
 (Svenonius 2010, (1))

²One way of thinking about how to derive such a constraint would be as the result of a learning process that favors positing a maximally transparent syntax/semantics mapping. In other words, a language learner would avoid positing new semantic rules (i.e., type-shifters) if independently motivated syntactic processes could derive the correct meaning and surface word order. Previewing the analysis to come, we note that *vP* ellipsis and movement out of an ellipsis site are independently motivated syntactic operations, so positing a type-shifter when the combination of these could derive the correct result would be avoided, despite the apparent structural complexity that results. We thank Kyle Johnson (p.c.) for this suggestion.

Path and Place heads are not mutually exclusive; they can cooccur, and when they do, Path occurs outside of Place.

- (6) ná gmá tábèl (Zina Kotoko)
 to on table
 “onto the table” (Holmberg 2002 via Svenonius 2010)



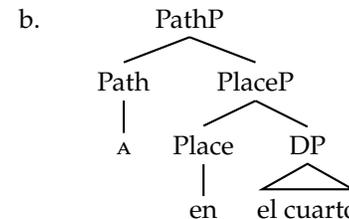
This sort of structure makes sense semantically, because paths are always specified relative to a place.

In some cases, either the path or the place head may be phonologically null, but in these cases they can be diagnosed semantically:

- (8) a. El gato está **en**_{PLACE} el cuarto.
 the cat is in the room
 “The cat is in the room.”
 b.
-
- ```

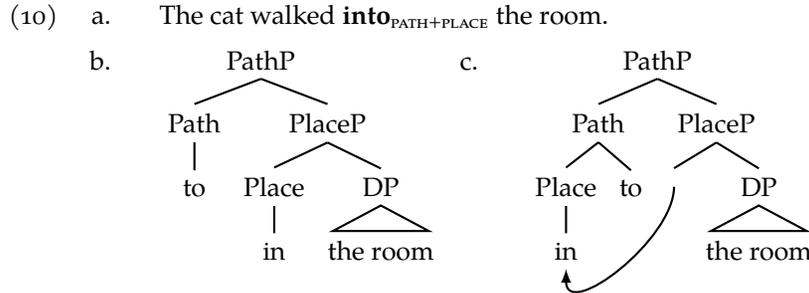
graph TD
 PlaceP --> Place
 PlaceP --> DP
 Place --> en
 DP --> el_cuarto[el cuarto]

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- (9) a. El gato entró **en**<sub>PATH+PLACE</sub> el cuarto.  
 the cat entered in the room  
 “The cat entered the room.”



In (8), *en* merely indicates the location of the cat. In contrast, in (9), *en* refers to a path whose endpoint is the room. This extra bit of meaning is represented in the structure as an unpronounced Path head, *A* ‘to’.

In some cases, there is apparent incorporation of a Place head into a Path head. For example, consider English *into*, which is proposed to have the following structure and derivation:



### 3.1 Decomposing Con/With

We propose that something like (10b–c) is the right structure for non-argument *con/with*. While it makes little sense semantically to decompose this instrumental *con/with* into a Path and a Place, it has a similarly complex meaning of a different sort.

We begin by considering a simplified example of instrumental *con* (11):

- (11) Juan paga la cuenta con la tarjeta de crédito.  
 Juan pays the bill with the credit card  
 “Juan pays the bill with the credit card.”

It has been widely noted that *v*Ps modified by instrumental *con/with* have a complex event structure, which involves relationships between at least three distinct events (Jerro 2017; Koenig et al. 2007; Mari 2006; Rissman 2013):

- $e_1$ : The subject acts on the instrument.
  - $e_2$ : The instrument acts on the theme.
  - $e_3$ : The theme is affected.
- $e_1 \xrightarrow{\text{CAUSE}} e_2 \xrightarrow{\text{CAUSE/FACILITATE}^4} e_3$

In other words, the meaning of a sentence like (11) could be (preliminarily) semantically represented as follows:

$$(12) \quad \exists e, e_1, e_2, e_3 : e_1 \in e \wedge e_2 \in e \wedge e_3 \in e \wedge \text{pay}(e) \wedge \text{TH}(e, \text{the.bill}') \wedge \text{AG}(e, j) \wedge \text{AG}(e_1, j) \wedge \text{TH}(e_1, \text{the.CC}') \wedge \text{CAUSE}(e_1, e_2) \wedge \text{AG}(e_2, \text{the.CC}') \wedge \text{TH}(e_2, \text{the.bill}') \wedge \text{CAUSE}(e_2, e_3) \wedge \text{TH}(e_3, \text{the.bill}') \wedge \text{pay}(e_3)$$

Existing approaches to the semantics of instrumentals tend to encode the entire complex relationship between  $e_1$ ,  $e_2$ , and  $e_3$  in one functional head. For example, Jerro (2017) gives the following semantics for the Kinyarwanda morpheme *-ish*, which has instrumental and causative uses (slightly adapted for presentational purposes):

$$(13) \quad \llbracket \text{-ish} \rrbracket = \lambda x. \lambda P_{\langle e, st \rangle}. \lambda y. \lambda e. P(e, y) \wedge \exists e' : e' \subset e \wedge \text{AG}(e', x)$$

Jerro assumes a theory of event structure whereby verbs describe events that have subparts that are causally related to each other. In other words, what it means to say that  $e' \subset e$  is to say that  $e'$  is part of the causal chain of  $e$ . If it is the initial event in  $e$ , it causes the second event in  $e$ , which causes the third, and so on. If it is not the initial event, it is caused by event  $e'_{-1}$ , and causes  $e'_{+1}$ , unless it is the final event in  $e$ .

Thus, while the lexical entry here only appears to make reference to two events, rather than the three posited above, the third event is implicit in the meaning of “ $\subset$ ” as used here. What this lexical entry does, then, is take an entity argument, the instrument, and a  $\langle e, st \rangle$  function  $P$ . The result describes events of  $P$ , which contain an event that has  $x$  as its agent. In other words, this says that  $x$  is an agent of a subevent in the causal chain of an event of  $P$ .

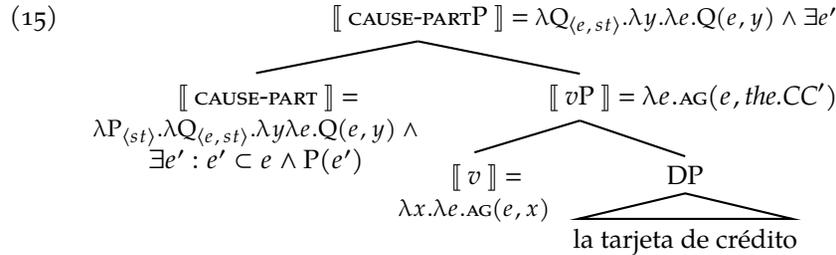
Assuming that *con/with* have the same meaning as *-ish*, we get the following semantics for (11):

$$(14) \quad \lambda e. \text{pay}(e) \wedge \text{TH}(e, \text{the.bill}') \wedge \text{AG}(e, j) \wedge \exists e' : e' \subset e \wedge \text{AG}(e', \text{the.CC}')$$

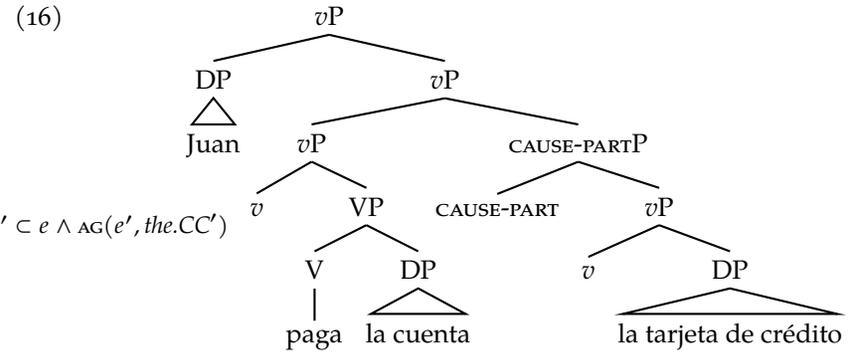
This describes event of paying the bill with Juan as the agent, which contain subevents in their causal chains that have the credit card acting as an agent. Given the definition of a causal chain, this means that the credit card will ultimately cause the bill to be paid.

<sup>4</sup>We assume for present purposes that facilitating events can be understood as events causing a particular event token of  $e_3$ . See Paul Portner’s personal communication cited in Koenig et al. (2007, p. 214) for more details.

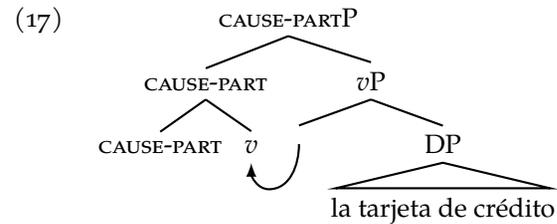
We propose decomposing Jerro’s denotation of *with* into simpler parts, much like the decomposition of spatial Ps above. In particular, we note that there is already a head that introduces an agent argument:  $v^\circ$  (Kratzer 1996). We therefore propose that *con/with* has the following structure and semantics:



All we have done here is taken Jerro’s denotation for *-ish*, and parcelled out its meaning into a part that introduces an event with an agent ( $v^\circ$ ),<sup>5</sup> and a part that says that event is part of the causal chain of another event (CAUSE-PART). CAUSE-PARTP will then combine with a projection of the main clause’s  $v^\circ$ , as in (16).



We assume *con/with* are the spell out of a complex head [ CAUSE-PART  $v^\circ$  ], following head movement of  $v^\circ$ :



<sup>5</sup>Putting a  $v^\circ$  inside *con/with* may give us a handle on the instrument/subject alternation. However, there may need to be a restriction that agent in the main clause be the initiator of  $e_1$ , since facilitating instruments cannot be subjects.

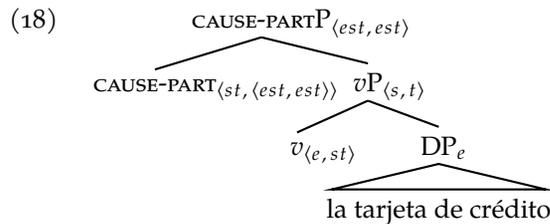
- (i) a. The knife cut the meat. / El cuchillo cortó la carne.  
(Spanish data from Fernández-Soriano & Mendikoetxea 2013, (15a))
- b. # The brush scrubbed the table. / #El cepillo frotó la mesa.  
(Spanish data from García-Pardo 2015, (5b))

It may be that verbs like *cortar/cut* can encode both “reduced” causal chains that start with  $e_2$  and “expanded” causal chains that start with  $e_1$ . In contrast, verbs like *frotar/scrub* may only encode the expanded causal chains, leaving them infelicitous with instrument subjects that cannot be agents of  $e_1$ . We leave precisifying this notion to further research.

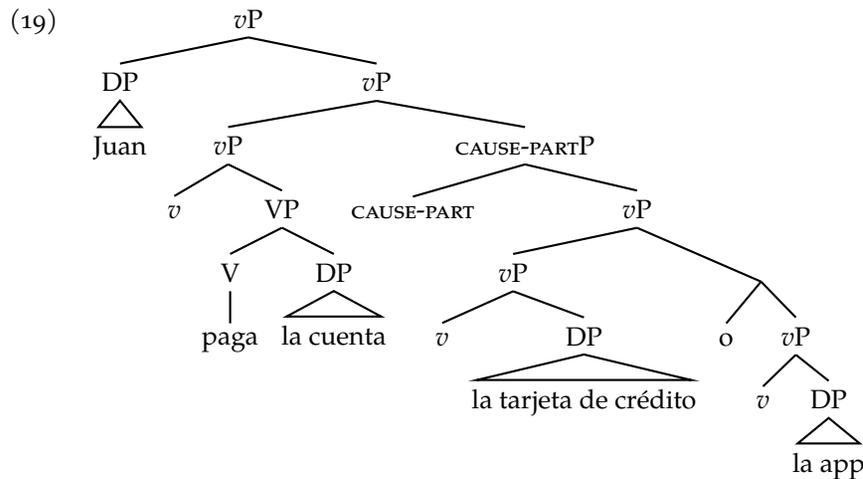
4. Adjunct Coordination with(out) P Repetition Is *v*P Coordination

Coordination preferentially operates on  $\langle s, t \rangle$  constituents (§2). Adjunct PPs have two functional projections, the lower of which is of type  $\langle s, t \rangle$  (§3). Coordination of the main clause *v*P is also possible, as it too is of type  $\langle s, t \rangle$ . Combining these facts allows us to derive the optionality of P repetition in (1b).

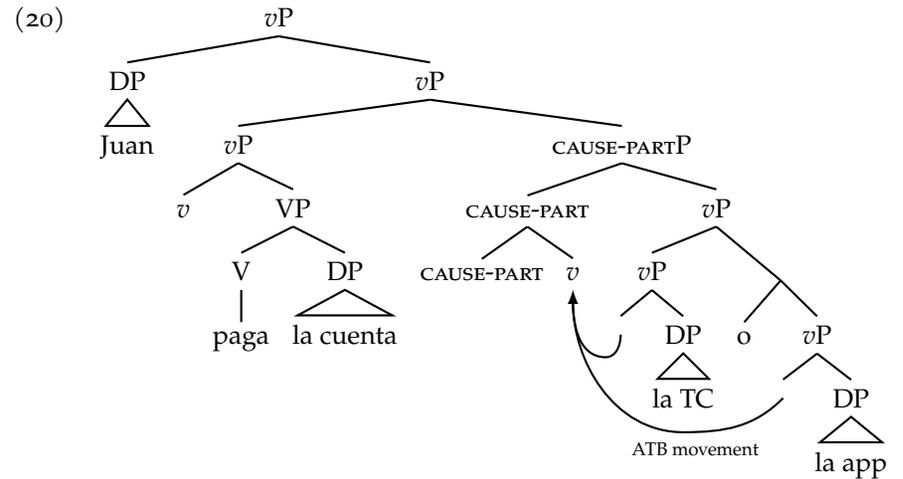
Now let us take stock of what we have done in the context of our theory of coordination. Assuming coordination can apply to any node on a tree, we have introduced a new locus of coordination inside instrumental *with*-phrases: *v*P below CAUSE-PARTP. This phrase is of type  $\langle s, t \rangle$ , and so can be coordinated without type-shifters—in other words, without inducing a cost (recall §2).



Coordinating this *v*P would result in the following sort of structure:

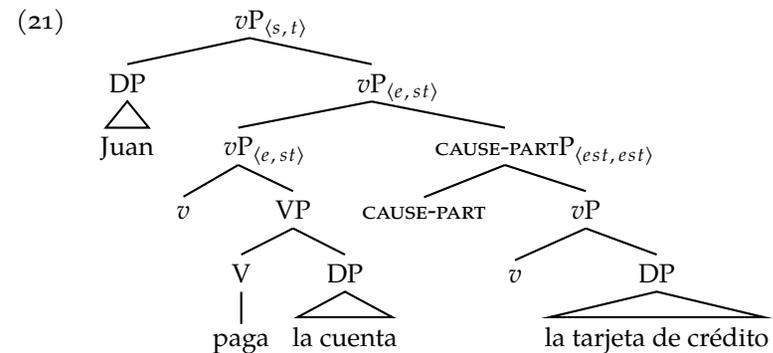


How is such a structure pronounced? Given that *con* is the spell-out of the complex head [ CAUSE-PART *v*<sup>o</sup> ], we propose that *v*<sup>o</sup> ATB moves to incorporate into CAUSE-PART:



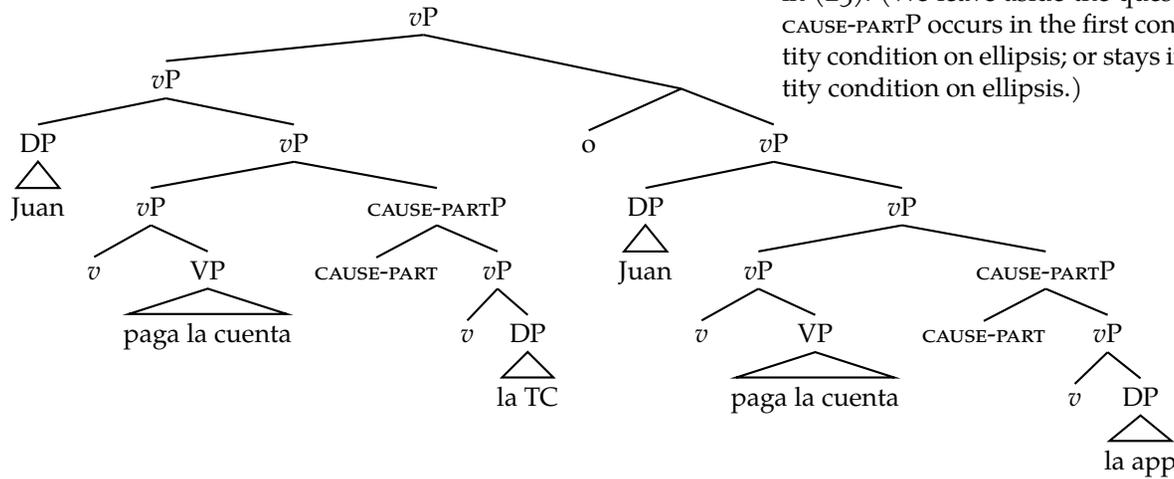
The resulting head is spelled out as *con*, but since there is only one head, *con* is only spelled out once. This leads to the case when the P is not repeated.

How can we derive at the structure where *con* is repeated? Given the types in (18), we cannot coordinate CAUSE-PARTPs except as a last resort, since they are not of type  $\langle s, t \rangle$ . Instead, we can coordinate the main clause's *v*P, since this forms a constituent of type  $\langle s, t \rangle$ :



Coordinating this *vP* would give us the following:

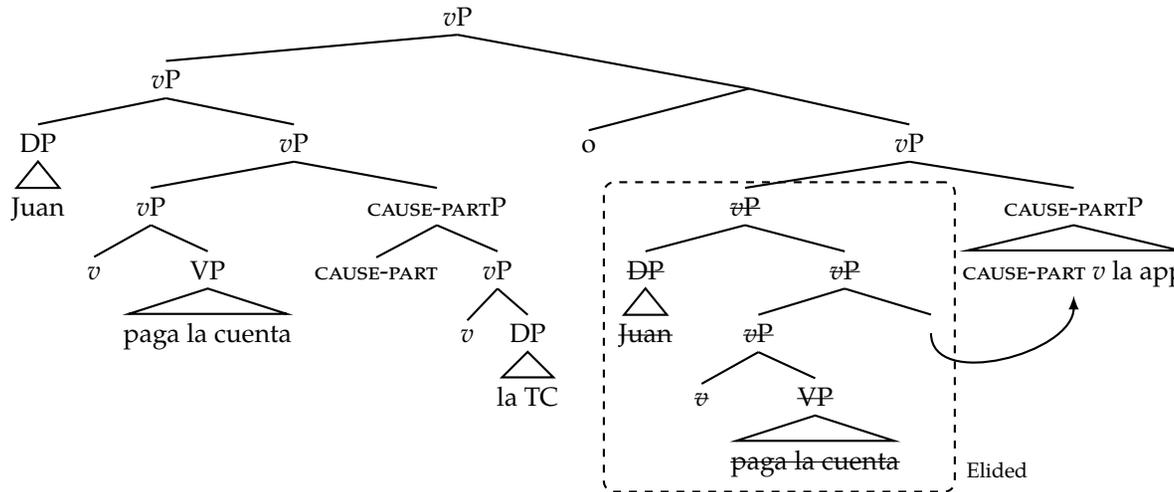
(22)



without repeated Ps, as in (20); and the structures with repeated Ps, as in (23). (We leave aside the question of whether a similar movement of CAUSE-PARTP occurs in the first conjunct, compatible with a syntactic identity condition on ellipsis; or stays in situ, compatible with a semantic identity condition on ellipsis.)

*vP* ellipsis can apply to the second conjunct. In order to pronounce the remnant *la app*, it must move out of the ellipsis site. When it does so, it pied-pipes the CAUSE-PARTP with it.

(23)

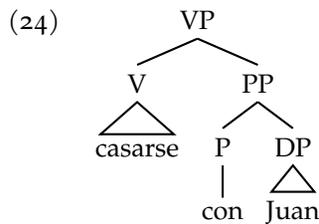


Within each conjunct, movement of  $v^{\circ}$  to CAUSE-PART $^{\circ}$  occurs, leading to *con* being spelled out twice. Thus, we can generate both the structures

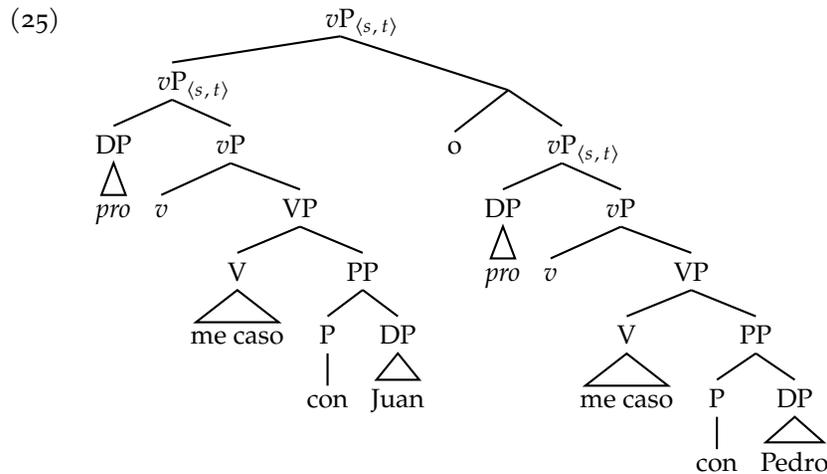
5. Argument Coordination Is Also *vP* Coordination

Coordination preferentially operates on  $\langle s, t \rangle$  constituents (§2). Argument PPs only have one projection, which is not of type  $\langle s, t \rangle$ . Combining these facts allows us to derive (1a). The fact that pied-piping is obligatory in Spanish and optional in English allows us to derive the difference between (1a) and (3).

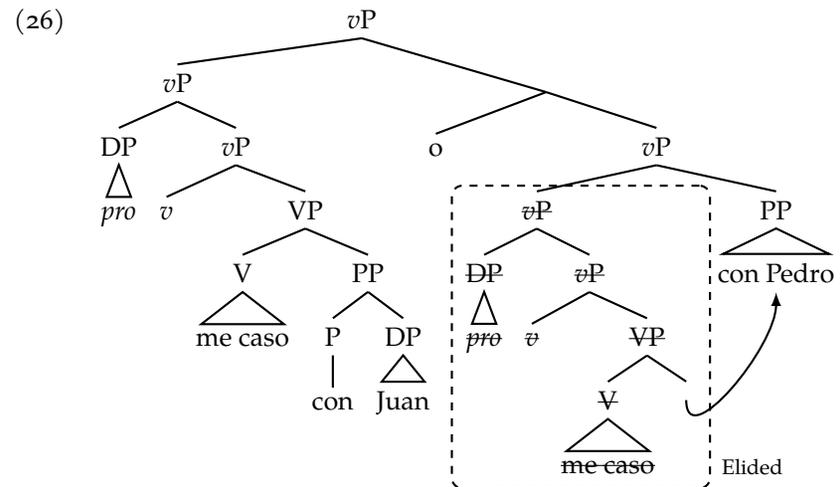
We now turn to the question of why argument coordination requires P repetition. Given that argument Ps are idiosyncratically selected and lack their usual semantic meaning, we assume they are structurally simple:



We remain agnostic on the semantic type of these PPs, except to note that they are clearly not of type  $\langle s, t \rangle$ . What this means is that there is no counterpart to (20) for arguments. Instead, argument coordination is similar to (23): it is *vP* coordination, which avoids the need for a type-shifter.



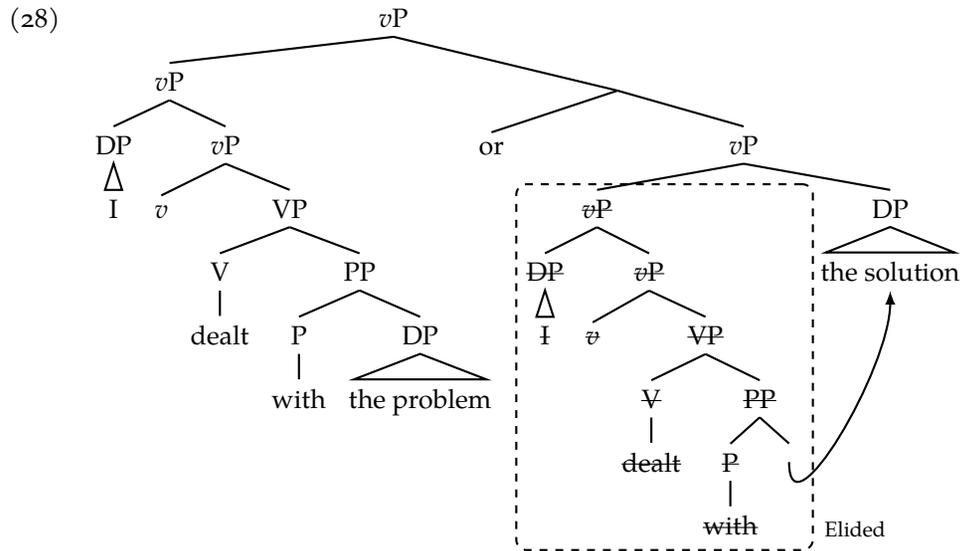
As before, the second conjunct can be elided. In order for the remnant to escape the ellipsis site, it moves out. Since pied-piping is obligatory in Spanish, *con* must come with it.



With this in mind, it is interesting to compare Spanish to English. In English, coordination of prepositional arguments allows for not repeating the P:

(27) I dealt with the problem or the solution.

We assume that the same constraints on coordination in Spanish hold for English. Instead, the difference between the two reduces to the obligatoriness of pied-piping in Spanish. In Spanish structures like (26), *con* must move out of the ellipsis site because pied-piping is obligatory in Spanish. In an equivalent English sentence, the preposition may remain in the ellipsis site, because pied-piping is optional:



## 6. Conclusion and Future Directions

Summarizing, we have shown that:

- §1 In Spanish, there is a contrast between coordination in argument and adjunct PPs: argument PPs require P repetition, while adjunct PPs allow for both repetition and non-repetition of P.
- §2 Assuming that coordination has a basic type  $\langle st, \langle st, st \rangle \rangle$  and that type-shifters are costly...
- §3 ...and that non-argument *con/with* can be decomposed into at least two functional projections, the lower of which is of type  $\langle s, t \rangle$ ...
- §4 ...non-repetition of P is derived in adjuncts via coordination of their lower, *vP* projection. Repetition of P in adjuncts is derived by coordination of the main clause *vP*.
- §5 Argument PPs lack the complex functional structure of adjunct PPs, so only *vPs* can be coordinated to avoid a type-shifting penalty, followed by *vP* ellipsis. In Spanish, this results in P repetition due to obligatory pied-piping; in English, this can result in either repeating P or not repeating P, as pied-piping is optional.

Future research should address whether we might want to take a stricter approach to coordination à la Hirsch (2017), who doesn't allow type-shifters. This would not affect our present analysis, since we always coordinate constituents of type  $\langle s, t \rangle$ .

In addition, the following datum suggests that this kind of analysis could extend to comitative and DP-internal uses of adjunct *con*:

- (29) Quiero helado con fresas o <sup>?</sup>(con) frambruesas.  
 I.want ice cream with strawberries or with raspberries  
 "I want ice cream with strawberries or raspberries."

We observe again here that comitative *con* is optional (though preferred as before). A starting point for a decompositional analysis of comitative *con/with* should note that its meaning is more complex than that of the *and* of logical conjunction or sum formation, despite claims to the contrary (in, e.g., Koenig et al. 2007). Consider the following contrast (Al Khalaf 2018):

- (30) a. A neighbor was cleaning with her pet.  
 b. # A neighbor and her pet were cleaning.  
 (Al Khalaf 2018, (13))

(30a) is acceptable under a comitative reading, but it is not possible to paraphrase it as (30b), since this latter requires the pet to be cleaning.

The same contrast exists in Spanish:

- (31) **Context:** A woman's neighbor's newborn son suddenly began having trouble breathing. The woman's and the neighbor's cars were broken down, but the child clearly needed medical attention quickly. The neighbor was still recovering from the birth, so...
- a. La mujer corrió una milla al hospital con el  
the woman ran a mile to.the hospital with the  
recién nacido para conseguir tratamiento.  
newborn in.order.to get treatment  
"The woman ran a mile to the hospital with the newborn to get treatment."
- b. 😊<sup>6</sup> La mujer y el recién nacido corrieron una milla al  
the woman and the newborn ran a mile to.the  
hospital para conseguir tratamiento.  
hospital in.order.to get treatment  
"The woman and the newborn ran a mile to the hospital to get treatment."

We leave a detailed syntactic and semantic analysis of the decomposition of comitative and DP-internal *con* for future work.



### Acknowledgements

We gratefully acknowledge our informants, Helena López Palma and Jorge Guzman, for judgements on the Spanish data. We would also like to give special thanks to Kyle Johnson for many detailed discussions and suggestions that have helped immensely in developing this project. Thanks also go to attendees of the UMass Syntax Workshop for feedback on an earlier version of this presentation. Any errors are our own.

<sup>6</sup>This is quite literally the judgement our informant provided.

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