Argument and Adjunct Coordination in Spanish

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Abstract: Spanish displays two ways of coordinating con-PPs: for argument con-PPs, prepositions must be repeated; for instrumental con-PPs, P-repetition is optional. To explain this fact, we first argue coordination operates on ⟨s, t⟩ constituents. Next, we argue instrumental con-PPs contain multiple functional projections, while argument con-PPs have only one. Coordination of the lower projection results in the P-less coordination, with coordination of the higher projection out because it is of the wrong type. Instead, coordination of vPs results in P-repetition: the second conjunct undergoes Gapping, the contrasted term moving from the ellipsis site. Since pied-piping is obligatory in Spanish, the P moves with the contrasted term, resulting in P-repetition. Only vP coordination is available for argument con-PPs, resulting in obligatory P-repetition.

Keywords: coordination, instrumentals, Gapping, pied-piping, P-stranding

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

Spanish shows an interesting asymmetry in coordination possibilities in the context of PPs. Consider the following sentences:

(1) a. Me caso con Juan o *(con) Pedro.
   1s.cl 1s.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 3s.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 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 3p.go to pay with credit card or
   **cheque de viajero**, cuenten=le al gerente
   traveler’s check 3p.tell.SBJV=3sDAT.CL to.the manager
   “If you will be paying with a credit card or a traveler’s check,
   please inform the manager.”
b. Las perlas se pueden pegar **con pegamento o cinta**
the pearls 3.cl.3p.can stick with glue or tape **adhesiva** en las caras de distintas cajas.

adhesive on the sides of different boxes

“The pearls can be attached to the sides of different boxes with glue or tape.”

This differs from English, where it is always possible to not repeat the preposition:

(3) a. I dealt with the problem or (with) the solution.

b. You can pay with a credit card or (with) the app.

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.

1s.cl 1s.marry Juan

b. * Me caso { a / por medio de / junto con } Juan.

1s.cl 1s.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 instrumenthood or
comitativity that it does when it introduces an adjunct, as in (1b). Note in particular that *con* here cannot be paraphrased with alternative phrases that introduce instruments (*por medio de*) or comitative accompaniers (*junto con*). Here, we focus on deriving the contrast in the case of instrumental *con*, though we offer some speculation about how our analysis might extend to comitative *con* in our conclusion.

We propose the following in order to explain the facts in (1)–(3): argument PPs are syntactically and semantically simple, while instrumental adjunct PPs are syntactically and semantically complex. Assuming a theory of coordination à la Partee & Rooth (1983), this explains the contrast in (1): (1a) allows for only one kind of coordinate structure in this theory, which involves Gapping in the second disjunct; while (1b) allows for two kinds of coordinate structures, one of which is like that available for (1a), and the other of which is possible because of the more complex structure of instrumental PPs. The first option results in P-repetition for both sentences, since the contrasted term must move to escape being Gapped; pied-piping is obligatory in Spanish, so the preposition must move as well. The second option for (1b), due to the more complex structure of instrumental *con*-PPs, involves coordination within the functional projection of the PP; this “low” coordination results in the variant of (1b) without P-repetition. To explain the contrast between Spanish and English in (1a) and (3a), we appeal to the fact that pied-piping is obligatory in Spanish and optional in English, so it
is possible for the contrasted term to move out of the ellipsis site in English without carrying along the preposition. We also briefly offer an explanation about why the usual prohibition of P-stranding under Gapping in English is circumvented in these kinds of structures.

The rest of the paper is organized as follows: in §2, we present our assumptions about coordination. §3 presents our analysis of the syntax and semantics of adjunct con-PPs, and §4 presents how to derive (1b) taking into account the results of §§2–3. In section §5, we present how to derive (1a) and (3) taking into account §2 along with the difference between pied-piping in English and Spanish; we also present in this section our explanation of why P-stranding is possible in these cases of Gapping in English. §6 concludes.

2. A Quick Note on Coordination

As a baseline, we assume a theory of coordination with the following characteristics. To start, coordinators have one basic semantic 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).1 These two facts will create a strong

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1 One way of thinking about how to derive such a constraint would be to treat it 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
preference for coordinators to operate on constituents of type \( (s, t) \) 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 “\( \land \),” which has the properties described above. The other is a sum formation operator “\( \oplus \),” which forms non-atomic entities (Link 1983). To avoid the potential confounds of the 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 PPs are internally complex, consisting of a number of distinguishable functional projections (Cinque & Rizzi 2010; Radkevich 2010; Roy & Svenonius 2009; Svenonius 2007, 2010, a.o.). One motivation for this can be seen in the distinction between

**Place** PPs 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. \( (\text{Place}) \)

b. They cast a wistful glance **to** the shore. \( (\text{Path}_{\text{GOAL}}) \)

c. The boat drifted further **from** the beach. \( (\text{Path}_{\text{SOURCE}}) \)

meaning and desired surface word order. Previewing the analysis to come, we note that Gapping 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.
Their ears sank down several notches. (Path)

(Svenonius 2010, (1))

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

(6) a. ná gmá tábèl (Zina Kotoko)

to on table

“onto the table”

(Holmberg 2002, cited in Svenonius 2010)

b. \[
\begin{array}{c}
\text{PathP} \\
\text{Path} \\
| \\
\text{PlaceP} \\
| \\
\text{DP} \\
| \\
\text{gmá tábèl}
\end{array}
\]

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

In some cases, a preposition may lexicalize Path and Place simultaneously (Fábregas 2007):

(7) a. Silenciosamente flotaba hacia la puerta.

Silently 3s.floated.IMP towards the door

“She floated silently towards the door.”

(Mario Vargas Llosa, La tía Julia y el escribidor, p. 261; cited in Fábregas 2007:170, (7))
In (7c), the complex head consisting of [ hacia\textsubscript{PATH} hacia\textsubscript{PLACE} ] gets spelled out as the single surface word \textit{hacia}.\footnote{Fábregas (2007) couches his analysis in terms of Ramchand (2008)’s system, in which lexicalization is defined in terms of contiguous spans of heads (see also Ramchand 2018). For our purposes, there is no crucial difference between this system, and a more traditional one involving head movement. We illustrate Fábregas’ analysis using head movement for ease of exposition.}

In some cases, this kind of incorporation of a Place head into a Path head is more phonologically obvious. For example, consider English \textit{into}, which might have the following structure and derivation:

(8)  
\begin{itemize}
  \item a. The cat walked \textbf{into}_{\text{PATH+PLACE}} the room.
  \item b. 
    \begin{itemize}
      \item \textbf{PathP}
        \begin{itemize}
          \item \textbf{Path}
            \begin{itemize}
              \item to \textbf{Place}
                \begin{itemize}
                  \item in \textbf{DP}
                    \begin{itemize}
                      \item in the room
                    \end{itemize}
                \end{itemize}
            \end{itemize}
        \end{itemize}
    \end{itemize}
\end{itemize}
3.1 Decomposing Con/With

We propose that something like (8b–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, though of a different sort.

We begin by considering a simplified example of instrumental *con* in (9):

(9) Juan paga la cuenta con la tarjeta de crédito.

Juan 3s.pay the bill with the credit card

“Juan pays the bill with the credit card.”

It has been widely noted that vPs 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.
• \( e_1 \) causes \( e_2 \), which causes and/or facilitates \( e_3 \).

In other words, the meaning of a sentence like (9) could be (preliminarily and schematically) semantically represented as follows:

\[
\exists e, e_1, e_2, e_3: (e_1 \in e) \land (e_2 \in e) \land (e_3 \in e) \land
\]

\[
(\begin{align*}
(e) & \quad \text{AG}(e, j) \land \text{pay}(e) \land \text{TH}(e, \text{the.bill}') \land \\
(e_1) & \quad \text{AG}(e_1, j) \land \text{TH}(e_1, \text{the.CC}') \land \text{CAUSE}(e_1, e_2) \land \\
(e_2) & \quad \text{AG}(e_2, \text{the.CC}') \land \text{TH}(e_2, \text{the.bill}') \land \text{CAUSE}(e_2, e_3) \land \\
(e_3) & \quad \text{TH}(e_3, \text{the.bill}') \land \text{pay}(e_3)
\end{align*})
\]

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):

\[
[\text{–ish}] = \lambda x. \lambda P(e, s) \lambda y. \lambda e. P(e, y) \land \exists e': e' \subset e \land \text{AG}(e', x)
\]

\(^3\) 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. (2007:214) for more details.
Jerro assumes a theory of event structure wherein verbs describe events that have causally related subparts. 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 “⊂” as used here. What this lexical entry does, then, is take an entity argument, the instrument, and an $\langle e, st \rangle$ 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 $con/with$ have the same meaning as –ish, we get (12) as the semantics for (9):

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

This describes events of paying the bill with Juan as their 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.

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

\[
\begin{align*}
  \llbracket \text{CAUSE-PART} \rrbracket & = \lambda \forall e, y \forall Q(e, y) \land \exists e' : e' \subset e \land AG(e', \text{the.CC}) \\
  \llbracket \text{CAUSE-PART} \rrbracket & = \lambda \forall e, y \forall Q(e, y) \land \exists e' : e' \subset e \land P(e') \\
  \llbracket v \rrbracket & = \lambda A . AG(e, \text{the.CC})
\end{align*}
\]

All we have done here is taken Jerro’s denotation for –ish, and parceled out its meaning into a part that introduces an event with an agent \((v^o)\)\(^4\) and a

\[^4\text{Putting a } v^o \text{ inside } con/with \text{ may give us a handle on the instrument/subject alternation: if an instrument is introduced by } v^o \text{ inside its adjunct, it is unsurprising that it could be introduced by a “normal” } v^o. \text{ However, there may need to be a restriction that the agent in the main clause be the initiator of } e_1, \text{ since facilitating instruments cannot be subjects.}\]

5 An anonymous reviewer notes a potential problem for using \(v^o\) to introduce both instruments and agents, as agents tend to be animate and instruments, inanimate. However, what counts as an agent may simply be vague (see Williams 2015, ch. 2:32, and ch. 7, §7.2 for a critical review of this idea); what we call instrument subjects may simply be the interpretation we get for an inanimate “agent.”

We suggest verbs like *cortar/cut* can encode both “reduced” causal chains starting with \((\text{what would normally be}) \ e_2\) and “expanded” causal chains starting 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 \(e_1\). An anonymous reviewer further suggests a relevant difference between (i-a) and (i-b) may be that the verbs in (i-a) encode a change of state, while those in (i-b) do not; we think this may correlate in some way with the verb’s ability to encode different sizes of causal chains (the change of state contrast cannot be the only relevant factor, since instrumental adjuncts can occur with non-change of state verbs). We must also ensure this observation about which verbs allow instrumental subjects holds in the general case. We leave these tasks for future research.
part that says that event is part of the causal chain of another event (CAUSE-PART°). CAUSE-PART° will then combine with a projection of the main clause’s \( v^o \), as in (14).

(14) (Diagram)

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theories of causation; a causer is clearly not intended to be the agent of a causing event, but defining it in other ways makes it difficult to integrate it with a semantic theory of causation. See also fn. 4 above, where we suggest that it may be the verb that is ambiguous, rather than the thematic relation of the subject.
We assume that *con/with* are the spell out of a complex head [CAUSE-PART $v^o$], following head movement of $v^o$.\(^6\)\(^,\)\(^7\)\(^,\)\(^8\)

(15)

\[\text{CAUSE-PART} \rightarrow \text{vP} \rightarrow \text{DP} \]

\[\text{la tarjeta de crédito}\]

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\(^6\) An anonymous reviewer asks if there is independent evidence for the decomposition we present in this section; namely, whether $vP+DP$ can ever be realized as a PP without CAUSE-PART, similarly to how PlacePs can occur without PathPs.

We note that while this would indeed strengthen the explanatory reach of our analysis, it is not strictly speaking necessary. For comparison, analyses of the English double object construction often invoke a covert preposition, which may incorporate into the verb (Beck & Johnson 2004; Harley 2002, 2011; Pesetsky 1995). However, this preposition is not thought to be overtly realized alone in English. Pesetsky (1995) argues for multiple kinds of null prepositions in analyses of the double object construction, object experiencer verbs, causative constructions, and some uses of adjectives in English; these prepositions are also not realized in English without incorporation into some other head. Finally, Landau (2010) presents an argument that experiencer arguments are universally introduced by prepositions which may be overt in some languages, but are often not in others. As such, the fact that a preposition may only be pronounced by incorporation (or not at all) is independently motivated in a variety of domains (also, cf. Fábregas’s 2007 analysis of *hacia* as consisting of two parts, above).

However, we also note it might be possible to analyze passive and nominal uses of *by* as spelling out $v^o$ to the exclusion of CAUSE-PART (cf. Collins 2005), in line with our reviewer’s suggestion (but see Bruening 2013 for a different treatment of passive *by*-phrases).

\(^7\) An anonymous reviewer notes that typologically, agents seem to be introduced by a functional head higher than one that introduces causes, while our analysis places $v^o$ below CAUSE-PART in contravention of this sequence. However, we note that this tendency clearly does not apply to cases of embedded causation, in which the agent of a caused event appears below the functional head introducing the relation between the causing event and the caused event (Johnson 2019 reports data from Muskogee Creek exemplifying this pattern, which holds more generally as well). We are dealing with exactly such a case of embedded causation here: the instrument is introduced as the agent of a subevent in the causal chain of the predicate, not as the agent of the full event.

\(^8\) An anonymous reviewer asks why instrumental *con* is spelled out the same as comitative *con*, despite comitative *con* presumably consisting of different components. We claim this is simply a case of accidental homophony, almost certainly for historical reasons (Heine & Kuteva 2006, ch. 5). In fact, instrumental markers and comitative markers are not syncretic in most (non-European) languages (Heine & Kuteva 2006, ch. 5); Mandarin Chinese, for instance, uses *yong* ‘use’ for instruments and *dai* ‘carry’ for comitative accompaniers. This broader picture gives us reason to doubt that there is a deep reason that these two distinct uses of *con/with* happen to be spelled out in the same way.
4. **Adjunct Coordination with(out) P-Repetition: vP Coordination**

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 *con/with*-phrases: the vP below *CAUSE-PART*P. This phrase is of type \( \langle s, t \rangle \), and so can be coordinated without using type shifters—in other words, without inducing a cost (recall §2). We re-present the structure and semantic types in (16):

\[(16)\]

Coordinating the vP in (16) would result in the following structure:

\[(17)\]
How is such a structure pronounced? Given that *con* is the spell-out of the complex head [ CAUSE-PART v° ], we propose that v° ATB moves to incorporate into CAUSE-PART:

(18)

The resulting head is spelled out as *con*, but since there is only one instance of [ CAUSE-PART v° ], *con* is only spelled out once. This leads to the case in (1b) when the P is not repeated.

How can we derive the structure where *con* is repeated? Given the types in (16), we cannot coordinate CAUSE-PARTPs except as a last resort, since they are not of type ⟨s, t⟩. Instead, we can coordinate the main clause’s vP, since this forms a constituent of type ⟨s, t⟩:
Coordinating this \( vP \) would give us the following:

How do we avoid pronouncing the subject and VP twice? We follow Schwarz (1999) and propose that Gapping applies to the second conjunct.\(^9\)

Gapping is a process that can apply in coordinate structures to elide material from a repeated \( vP \):

(21) \( \text{Álex toca el violín y Marta } \triangle \text{ el piano.} \)

Alex 3s. play the violin and Marta the piano

“Alex plays the violin and Marta the piano.”

(Brucart & MacDonald 2012:582, (10))

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\(^9\) We are indebted to Kyle Johnson (p.c.) for this suggestion.
One kind of analysis of Gapping treats it as ellipsis of a vP constituent from which contrasted terms have moved (e.g., Johnson 2014, to appear); we will adopt this treatment. We also assume a “small conjuncts” account of Gapping; see Johnson (to appear), §4.1 for arguments in favor of this view, which we avoid repeating here for reasons of space.¹⁰ Note that this analysis will require us to assume that Gapping can elide a vP, but that it is not vP-ellipsis, as Spanish lacks that process (we thank a reviewer for pointing this out to us). It seems clear though, that despite its being able to elide vPs, Gapping cannot be the same process as vP-ellipsis. We leave aside the question of what exactly it is that is responsible for this mysterious difference between the two processes, though see Johnson (2009) for an argument about what this difference is, which we believe the present account could easily incorporate. We do not present our analysis in terms of Johnson (2009)’s because its predictions do not differ from the simpler analysis we will assume with regards to the facts we examine here.

We follow Schwarz (1999) and assume that Gapping can produce structures with only one contrasted term.¹¹ In the case of (20), that will mean that in order to pronounce the contrasted DP *la app*, it must move out of the gapped constituent. Because pied-piping of prepositions is obligatory in

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¹⁰ Our approach should also work under a large conjuncts account as well, so the choice does not appear to be crucial. The only difference regards our analysis of the supposed impossibility of P-stranding in English Gapping in §5.1, which is controversial (see fn. 14).

¹¹ Under some approaches, this might be equivalent to Stripping. See Johnson (to appear) for discussion.
Spanish, when *la app* moves to escape the gapped constituent, it must pied-pipe the CAUSE-PARTP with it.

(22)

Within each disjunct, movement of $v^0$ to CAUSE-PART$^0$ occurs, leading to *con* being spelled out twice. Thus, both the structures without repeated Ps following (18), and the structures with repeated Ps following (22) are generated. (We leave aside the question of whether CAUSE-PARTP undergoes a similar movement in the first conjunct in cases like (22), compatible with a syntactic identity condition on ellipsis; or stays in situ, compatible with a semantic identity condition on ellipsis.)

5. **Argument Coordination: Also vP Coordination**

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 \((s, t)\).\(^{12}\) What this means is that there is no counterpart to (18) for argument PPs. Instead, argument coordination is

\[
\text{(23)}
\]

![Diagram](image)

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\(^{12}\) Two anonymous reviewers note examples like the following that show that there may be more nuance to the argument coordination cases:

(i) a. Me aburro con las películas y (con) los conciertos
   1s.cl 1s.bore with the movies and with the concerts
   “I get bored with movies and concerts.”

   b. Rompí con la rutina y (con) la monotonia diarias
   1s.breakPRET with the routine and with the monotony daily.FEM.PL
   “I broke with the daily routine and monotony.”

   c. Anoche, soñé con un elefante y (con) un tigre.
   Last.night 1s.dream.PRET with a elephant and with a tiger
   “Last night, I dreamt about an elephant and a tiger.”

These sentences feature argument coordination, but \textit{con}-repetition is only optional, and even dispreferred in some cases, such as (i-b). We would like to mention three possibilities: first, these are cases of conjunction rather than disjunction, which are plausibly receiving a sum formation reading rather than a predicate conjunction reading, which could be obscuring the contrast we focus on (see §2 for details)—particularly in the second case, with two singular conjuncts but plural agreement on the adjective. Second, these sentences feature objects which receive non-specific interpretations, whereas the objects in our sentences receive specific interpretations. Non-specific nominal expressions have been proposed to be predicates rather than arguments (Chierchia 1998; but cf. Borer 2005). In this case, these expressions would thus have to integrate syntactically and semantically in a different way with the rest of the sentence than expressions of type \(e\), which could lead to a different coordination strategy. We thank a reviewer for this second suggestion. Third, it may the case that not all argumental \textit{cons} are structurally simple; it seems plausible, for instance, that the \textit{con} in \textit{soñar con} may carry more meaning—and, by extension, more structure—than the \textit{con} of \textit{casarse con} does. Obviously, this last sort of explanation is not ideal, but it may be justified if independent evidence could be found to support it. We leave aside the details for future work, due to reasons of space.
similar to (20): it is (matrix) vP coordination, which avoids the need for a type-shifter. This is shown in (24):

(24)

As before, material in the second conjunct can be gapped. In order for the contrasted DP, Pedro, to escape the ellipsis site, it moves out. Since pied-piping is obligatory in Spanish, con comes with it, as in (25):

(25)
With this in mind, it is interesting to compare Spanish to English. In English, coordination of prepositional arguments allows for not repeating the P, as shown in (3a), repeated as (26):

(26)  I dealt with the problem or (with) the solution. (=3a)

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 (25), *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. This is shown in (27):
5.1 The P-Stranding Restriction in English Gapping

Our analysis of (26) in terms of Gapping initially seems to cause a problem, given the generalization that English usually prohibits P-stranding in Gapping structures.

(28)  
  a. Charley writes with a pencil and John writes with a pen.
  b. * Charley writes with a pencil and John writes with a pen.

(Hankamer 1979:18, cited in Johnson 2014:12, (41a–b))

If this is so, why can *with be stranded in (27), leading to its not being pronounced twice, when it cannot be so stranded in (28)?

We propose that two facts explain the contrast between (27) and (28): first, Abe & Hoshi (1997)’s Crossing Constraint on Gapping (adapted from Pesetsky 1982); and second, the fact that the availability of P-stranding depends on whether movement is short or long: short movement disallows P-stranding, while sufficiently long movement allows it.

Let us first discuss the Crossing Constraint on Gapping:

(29) Crossing Constraint on Gapping (CCG):

A contrasted element cannot cross another contrasted element.

(Abe & Hoshi 1997, Pesetsky 1982)

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13 This section in particular owes much to suggestions from and conversations with Kyle Johnson (p.c.).

14 But see Kuno (1976), Steedman (1990), Vanden Wyngaerd (2007), and Johnson (to appear) for counterexamples and counterarguments; if they are ultimately correct, that would simplify our explanation of why English does not require P-repetition for arguments.
(30) **Crossing:**

A crosses B iff B asymmetrically c-commands one of A’s traces, and A asymmetrically c-commands B.\(^{15}\)

Consider how (29) rules out the ungrammatical gap in (31):

(31) a. *John dealt with Mary, and with Bill, Susan.

b. *John dealt with Mary, and \[ [\text{with Bill}]_i [\text{Susan } [\text{dealt } t_i]]] \]

Here, both *with Bill* and *Susan* are contrasted elements in the coordinate with Gapping. *Susan* asymmetrically c-commands the trace of *with Bill*, but *with Bill* asymmetrically c-commands *Susan* (shown in (31b)). As such, *with Bill crosses Susan*. Since these are both contrasted elements, (29) rules out the structure in (31b).\(^{16}\) The consequence of this is that in structures involving two contrasted terms, one of which is a subject, and the other a PP, the PP will not be able to move to a higher position than the subject. In other words, a PP that moves out of a gapped constituent will have to undergo a short movement inside the vP that cannot take it above the subject.

\(^{15}\) Abe & Hoshi (1997) define crossing in linear terms. We define it structurally, more in line with Pesetsky (1982).

\(^{16}\) Note that we must say more to allow the grammatical (i):

(i) With Mary, John dealt, and with Bill, Susan.

Presumably, we have to allow no more crossings of contrasted elements than those that their correlates in the antecedent display; there is also a constraint that the linear order of contrasted elements in a gapped coordinate must match the linear order of their correlates in the antecedent (Johnson to appear), which may or may not be reducible to a properly formulated version of the CCG. We leave the exact formulation of this refinement of the CCG for future work.
This fact matters because there is independent evidence that P-stranding is disallowed for short movements of this sort, even in languages which allow it in long movements (here, movements above Spec,vP). For instance, Object Shift in English and Icelandic disallows P-stranding (Holmberg 1986, Johnson 1991, Thráinsson 2001), while this is allowed in longer movements such as wh-movement, tough-movement, and topicalization, as well as in pseudo-passives (Jónsson 2008; Maling & Zaenen 1985, 1990; Thráinsson 2001, 2007).

(32)  
a. I will put up the book.

  b. I will put the book up with ti.

  c. I will put up with the book.

  d. * I will put the book up with ti.

(33)  
a. What will you put up with ti?

  b. That book is hard to put up with ti.

  c. That, I won’t put up with ti.

  d. Old textbooks are only barely put up with ti by students.\footnote{We use put up with in all examples in (33) for consistency, despite some oddness in the pseudo-passive. However, pseudo-passives are not all consistently degraded; cf. The bed was slept on last night, which is completely acceptable. Additional factors influence the availability of pseudo-passives that likely account for (33d)’s slight oddness (such as the affectedness of the deep object). But it is clear regardless that pseudo-passives in English allow P-stranding; indeed, it is one of their defining characteristics.}

(34)  \textit{Icelandic}:

a. Þá máluðu allir strákarnir stundum bflana rauða.

then painted all boys-the sometimes cars-the red
b. Þá máluðu allir strákarnir bílana, stundum tₜ rauða.
   then painted all boys-the cars-the sometimes red
   “Then all the boys sometimes painted the cars red.”
   (Thráinsson 2001:153, (15a–b))

c. Jón talaði ekki [PP við Maríu].
   Jon spoke not with Mary
   “John didn’t speak to Mary.”

d. * Jón talaði Maríu ekki [PP við tₜ].
   (Thráinsson 2001:151, (6a–b))

(35) Icelandic:

a. Hvaði eruð þið að tala um tₜ?
   What are you to talk about
   “What are you (pl.) talking about?”
   (Jónsson 2008:404, (1a))

b. Sigrúnur, hef ét aldrei talað við tₜ.
   Sigrun have I never spoken to
   “Sigrun, I have never spoken to.”
   (Thráinsson 2007:345, (7.6b))

For example, (32a–b) show that Object Shift is possible across a particle for a DP in English, while (32c–d) show that this cannot occur if such
movement would strand a preposition.\(^\text{18}\) (33) shows various examples of longer movements which do allow P-stranding in English. For Icelandic, (34a–b) shows Object Shift of a DP bílana ‘the cars’ across an adverb stundum ‘sometimes,’ while (34c–d) show that Object Shift is blocked if the moved DP would strand a preposition. (35) shows examples of longer movements that allow P-stranding in Icelandic. These facts show that short movements disallow P-stranding, even if long movements allow it.\(^\text{19}\)

\(^{18}\) Note that pied-piping does not save (32d) nor (34d) (Johnson 1991, Thráinsson 2001):

(i) a. * I will put [\textit{PP with the book,}] up \textit{t}.
   b. * Jón talaði [\textit{PP við Maríu}, ekki \textit{t}].
      Jon spoke with Mary not
   
   (Thráinsson 2001:151, (6c))

We assume that short movement of PPs must be rightward for independent reasons (Kyle Johnson, p.c.). We note that this restriction also holds of CPs:

(ii) a. John pointed out the problem to the dean.
    b. John pointed the problem, out \textit{t} to the dean.
    c. John pointed out that Bill had left to the dean.
    d. * John pointed [\textit{CP that Bill had left},] out \textit{t} to the dean.

(iii) \textit{Icelandic}:

   a. Jón sagði ekki að María hefði farðið.
      Jon said not that Mary had left
   b. * Jón sagði [\textit{CP að María hefði farðið}, ekki \textit{t}].
      (Thráinsson 2001:164, (38i–j))

We assume that the facts in (i) are of a piece with the facts in (ii) and (iii), without committing to any particular analysis. Also, note that just because PP movement is ruled out in (i) doesn’t entail that movement of a DP out of a PP should be similarly ruled out; PP-movement is also impossible in pseudo-passives (*On the bed was slept), but that does not prevent P-stranding movement of the DP from being grammatical in those cases.

\(^{19}\) Standard examples of Object Shift cross negation, which is often assumed to occur above \textit{vP}. Our explanation would thus seem to incorrectly predict that Object Shift across negation should allow P-stranding, contrary to (34d). However, negation may be lower than is typically thought. For instance, Thráinsson (2001:153) notes that “long” Object Shift across a post-verbal subject cannot occur, even though Object Shift does occur across negation. (Though some theories of negation put it lower than \textit{Spec,vP}; see Champollion (2011) for a theory of this sort.) But also problematic are examples of Object Shift crossing stranded subject-modifying quantifiers (Holmberg 1986:165; Thráinsson 2001:198), which are presumably left behind in \textit{Spec,vP} following movement of the subject.
We can form even closer pairs by comparing verbal to nominalizing uses of –ing in English. One way in which these differ is that the verbal use of –ing introduces objects normally, while the nominal –ing requires using of to do so. Object Shift can only occur with verbal –ing:

(36)  
\begin{align*}
  &a. \quad \text{John hastily looking up the reference bothered me.} \\
  &b. \quad \text{John hastily looking the reference; up } t_i \text{ bothered me.} \\
  &c. \quad \text{John’s hasty looking up of the reference bothered me.} \\
  &d. \quad * \text{John’s hasty looking the reference; up of } t_i \text{ bothered me.}
\end{align*}

The meanings of the verbal and nominal structures here seem to be very similar here. Holmberg (1986:199) gives a similar near minimal pair for Swedish tro, which can occur with or without a preposition (he does not offer an English free translation for these examples):

(37) \begin{align*}
  &a. \quad \text{Jag tror inte på det.} \\
  &\quad \text{I believe not in it} \\
  &b. \quad * \text{Jag tror det; på inte } t_i. \\
  &c. \quad \text{Jag tror det; inte } t_i.
\end{align*}

(Holmberg 1986:199, (118a–b); (121))

We again see that this sort of short movement cannot strand a preposition. But when there is no preposition, Object Shift is possible.

We have now shown that when there are two contrasted terms in a constituent with a gap, and one of those terms is the subject, any contrasted

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Explaining such issues may require further refinement of which movements count as “short” and which as “long,” a complication which we leave aside here.
PP can only undergo short movement, due to the CCG. Short movement does not allow P-stranding. This accounts for why P-stranding is disallowed when a subject is contrasted in a gapped constituent, even though English generally allows P-stranding. Furthermore, this predicts that when the subject is not contrasted, a contrasted PP will move past it; thus, P-stranding should be possible in cases when the subject is not contrasted, shown in (38):

(38)  a. ? On Monday, John dealt with the problem, and on Tuesday, the solution.

       b. John dealt with the problem on Monday, and the solution on Tuesday.

In (38), *with* can be stranded, regardless of whether it occurs before or after the other contrasted term (provided the order of the contrasted terms corresponds to the order of their correlates). We find a slight oddness in (38a), but it seems more acceptable than (28b), where a subject is the other contrasted term; (38b) is, however, completely acceptable. This offers further support for the idea that, in a gap, movement across the subject is key to the availability of P-stranding in languages like English.

Now, we have an explanation for why P-stranding is allowed in a structure like (39), despite our analysis in terms of Gapping:

(39) I dealt with the problem or (with) the solution. (=(26))

As discussed above, we treat this as a case of Gapping with one contrasted term. This means that the non-contrasted subject will remain in the second
conjunct, and the contrasted term must move past it to escape being gapped. This is thus a case of long movement by our definition, and so P-stranding will be allowed exactly as shown in (27). We thus have an account for why P-stranding is disallowed in canonical Gapping structures involving a contrasted subject and a contrasted PP like those in (28), but allowed in cases like (38)–(39) in English.

Of course, we are not claiming here that the only thing influencing the availability of P-stranding is the distance that a targeted DP moves. Clearly, Spanish does not allow P-stranding even for long distance movement. We are merely claiming that in languages that do allow P-stranding, it seems to be only allowed in long movements. In other languages, like Spanish, P-stranding will be ruled out altogether for some independent reason, and this will be what prevents it in (25).

6. Conclusion and Future Directions

Summarizing, we have shown that in Spanish, there is a contrast between coordination in argument PPs and instrumental adjunct PPs: argument PPs require P-repetition, while instrumental adjunct PPs allow for both repetition and non-repetition of P. We assume that coordination has a basic type of \( \langle \text{st}, \langle \text{st}, \text{sr} \rangle \rangle \) (Partee & Rooth 1983), and propose that non-argument con/with can be decomposed into at least two functional projections, the lower of which is of type \( \langle s, t \rangle \). This allowed us to derive
non-repetition of P in instrumental adjunct coordination via coordination of this lower, vP projection. Repetition of P in instrumental adjuncts is derived by coordination of the main clause vP. Argument PPs, in contrast, lack the complex functional structure of instrumental adjunct PPs, so only the main clause vP can be coordinated to avoid a type-shifting penalty. Coordination of the main clause vP is followed by Gapping: 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 in Gapping structures that involve long movement of the PP, a claim for which we provided independent evidence. Future research should address whether we might want to take a stricter approach to coordination à la Hirsch (2017), whose theory is like ours, but doesn’t allow type-shifters. However, disallowing type-shifters would not affect our present analysis, since we always coordinate constituents of type (s, t).

In addition, we offer some speculation regarding how our analysis might be extended to account for comitative and DP-internal uses of adjunct con:

(40) Quiero helado con fresas o (con) frambruesas.

1s.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):

(41)  

a. A neighbor was cleaning with her pet.

b. # A neighbor and her pet were cleaning.

(Al Khalaf 2018, (13))

(40a) is acceptable under a comitative reading, but it is not possible to paraphrase it as (40b), since this latter sentence would require the pet to be cleaning—which is decidedly odd. The same contrast exists in Spanish:

(42)  

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 recién nacido para conseguir tratamiento

“The woman ran a mile to the hospital with the newborn to get treatment.”
b. # La mujer y el recién nacido corrieron una milla 
the woman and the newborn 3p.run.PRET a mile
al hospital para conseguir tratamiento.
to the hospital for 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, and its possible integration with the analysis presented here, for future work.

References


