The text and figures in this PDF are approved by the author(s) for publication. Any mistakes in this PDF will not be corrected by the publisher. This PDF was created on June 15, 2021.

Parasitic Gaps in Ditransitives and Antilocality

Karlos Arregi and Andrew Murphy

1. Introduction: Parasitic gap asymmetries in ditransitives

Since Engdahl (1983), parasitic gaps (PGs) have been a longstanding topic of interest in syntactic theory (Culicover 2001). While PGs inside adjunct clauses have been relatively well-investigated, far less attention has been devoted to argument-internal PGs. In this paper, we present a novel observation about argument internal PGs: In the double object construction (DOC) in (1), movement of the lower object cannot license a PG in the higher object, whereas a parallel configuration is possible in other ditransitive frames such as the prepositional dative construction (PDC) in (2).

(1) *Double object construction*
*Which books$_1$ did you give [$_{DP}$ fans of pg_1] t$_1$ yesterday?

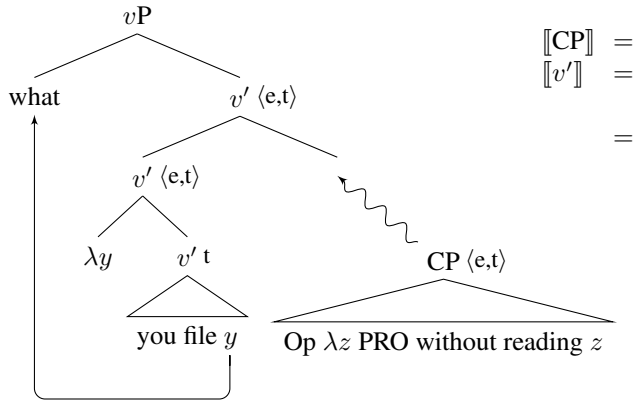
(2) *Prepositional dative construction*
Who$_1$ did you give [$_{DP}$ pictures of pg_1] [$_{PP}$ to t$_1$] yesterday?

This follows, we argue, from Nissenbaum's (1998, 2000) analysis of PGs and the assumption that the PG-licensing movement step is constrained by Antilocality (Abels 2003). This also has broader implications for the nature of successive cyclic movement and phases.

2. The licensing configuration for parasitic gaps

Nissenbaum (1998, 2000) provides an elegant theory of PGs in adjuncts that is based on the licensing configuration in (3): An XP containing a PG (the adjunct CP in (3)) must be merged between the PG's antecedent (*what*) and the λ-binder derived by intermediate movement of the antecedent (at the edge of vP in (3)). Due to null operator movement, the CP containing the PG is of type $\langle$e,t$\rangle$ and can combine with its sister via Predicate Modification to give the denotation of the topmost v' projection in (3).

(3) What$_1$ did you file t$_1$ [without reading pg_1] ?



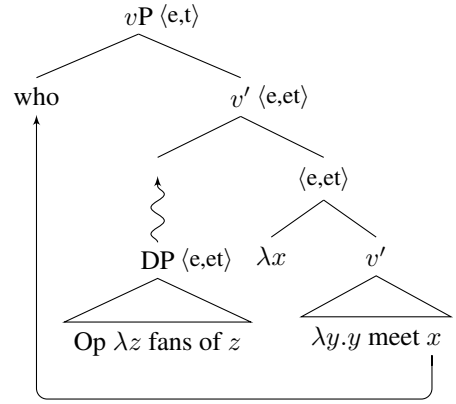
$$\begin{aligned} [\![\text{CP}]\!] &= \lambda z.\ \textbf{not-read}(\textbf{you}, z) \\ [\![v']\!] &= \lambda x.\ [\lambda y.\ \textbf{file}(\textbf{you}, y)](x) \wedge \\ &\quad\ [\lambda z.\ \textbf{not-read}(\textbf{you}, z)](x) \\ &= \lambda x.\ \textbf{file}(\textbf{you}, x) \wedge \\ &\quad\ \textbf{not-read}(\textbf{you}, x) \end{aligned}$$

Nissenbaum argued that this can be extended to subject-internal PGs if the subject is merged after intermediate movement of the antecedent, as shown in (4). Assuming that bare plurals are of type $\langle$e,t$\rangle$,

* Karlos Arregi, The University of Chicago, karlos@uchicago.edu. Andrew Murphy, The University of Chicago, andrew.murphy@uchicago.edu. For helpful discussion, we would like to thank audiences at WCCFL 39 and GLOW 44, as well as Maja Stina Sunleaf, Zach Lebowski and Erik Zyman for discussion of the data.

adding a PG makes the DP of type ⟨e,et⟩. The subject combines with its sister that is also a two-place predicate. This takes place via a recursive mode of composition proposed in Nissenbaum 1998 and Nissenbaum & Schwarz 2011, which can also be extended to definite and quantified DPs containing PGs.

(4) Who$_1$ did [$_{DP}$ fans of pg_1] meet t$_1$?



$$
\begin{aligned}
[\![\text{DP}]\!] &= \lambda z \lambda u.\ \textbf{fan-of}(u, z) \\
[\![v']\!] &= \lambda x' \lambda y'.\ [\lambda x \lambda y.\ \textbf{meet}(y, x)](x')(y') \wedge \\
&\qquad\qquad [\lambda z \lambda u.\ \textbf{fan-of}(u, z)](x')(y') \\
&= \lambda x' \lambda y'.\ \textbf{meet}(y', x') \wedge \textbf{fan-of}(y', x')
\end{aligned}
$$

We assume that the same mechanisms are involved in the syntax and semantics of all argument-internal PGs.

3. Object-internal parastic gaps and the Minimal Distance Generalization

Parasitic gaps are also possible in internal arguments of a ditransitive predicate (Engdahl 1983), e.g. in the higher object of a PDC (5a). In contrast, a PG is not possible in the higher object of a DOC (6a) (mentioned in den Dikken 2018:97, fn. 46). A PG in the lower object, as in (5b) and (6b), is ruled out by Engdahl's anti-c-command condition, which states that the licensing gap may not c-command the PG. However, this alone cannot account for (5a) vs. (6a).

(5) *Parasitic gaps in the prepositional dative construction*

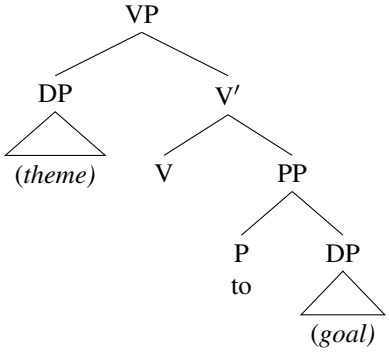
a. Who$_1$ did you give [$_{DP}$ pictures of pg_1] [$_{PP}$ to t$_1$] yesterday?
b. *Which books$_1$ did you give t$_1$ [$_{PP}$ to [$_{DP}$ fans of pg_1]] yesterday?

(6) *Parasitic gaps in the double object construction*

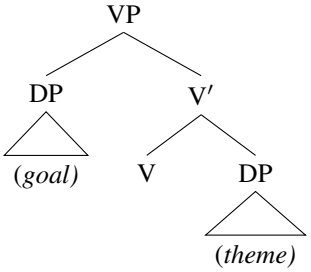
a. *Which books$_1$ did you give [$_{DP}$ fans of pg_1] t$_1$ yesterday?
b. *Who$_1$ did you give t$_1$ [$_{DP}$ pictures of pg_1] yesterday?

We assume the following structures for the VP in PDCs and DOCs:[1]

(7) *Prepositional dative construction*



(8) *Double object construction*



[1] Our analysis is compatible with certain other theories of ditransitives, e.g. Pylkkänen's (2008) low Appl, but not with high Appl. See the section 6 for further discussion.

We propose that the ungrammaticality of (5a) instantiates the *Minimal Distance Generalization*, stated in (9). In our analysis, the crucial difference between (5a) and (6a) is the presence of the PP layer dominating t_1 in (5a).

(9) *Minimal Distance Generalization*
A PG-containing DP and the licensing gap cannot be structurally too close:
$*[_{DP} \ldots pg_i \ldots] \ldots [_{\alpha} \ldots t_i$, unless α is a maximal projection.

We will first consider, and reject, two potential alternative explanations before discussing the supporting evidence for this generalization.

3.1. It's not adjacency

This first possible alternative account for the contrast between (5a) and (6a) would be that the 'closeness' in the Minimal Distance Generalization actually involves linear proximity, rather than structural distance. In other words, a PG may not be adjacent to its licensing gap, as in (6a). However, this approach cannot account for the examples in (10) (adapted from Haegeman 1984:231 and Chomsky 1986:54, respectively), which show that a PG can in principle be adjacent to its licensing gap.

(10) a. This is a note which$_1$ [unless we destroy pg_1] [$_{TP}$ t_1 will ruin our relationship]
b. ?a man who$_1$ [whenever I meet pg_1] [$_{TP}$ t_1 looks old]

Furthermore, we might expect (6a) to improve by adding a DP-internal modifier that intervenes between the two gaps. As (11) shows, this is not the case.

(11) *Which book$_1$ did you give [a fan of pg_1 with long hair] t_1 yesterday?

Even though the PG and its licensing gap are not adjacent, the example is still ungrammatical. This indicates that linear adjacency is not at stake here. In structural terms, however, the PG and the licensing gap are still too close according to the Minimal Distance Generalization.

3.2. It's not θ-roles

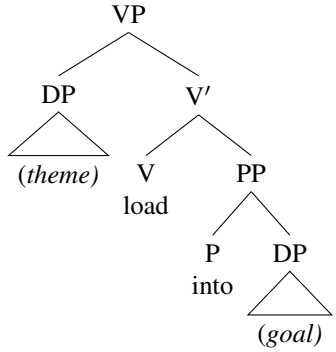
Novel data from the *spray/load*-alternation in (12)–(13) show that the correct generalization is not about θ-roles either. Here, a PG is possible in the higher object in both constructions.

(12) *Spray-load alternation (prepositional goal)*
a. Which trucks$_1$ did you load [$_{DP}$ pictures of pg_1] [$_{PP}$ into t_1] yesterday? (✓PG in Theme)
b. *Which pictures$_1$ did you load t_1 [$_{PP}$ into [$_{DP}$ boxes for pg_1]] yesterday? (✗ PG in Goal)

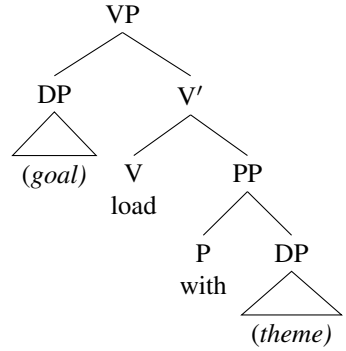
(13) *Spray-load alternation (prepositional theme)*
a. Which pictures$_1$ did you load [$_{DP}$ boxes for pg_1] [$_{PP}$ with t_1] yesterday? (✓PG in Goal)
b. *Which boxes$_1$ did you load t_1 [$_{PP}$ with [$_{DP}$ pictures of pg_1]] yesterday? (✗ PG in Theme)

We assume the following structures for the *spray/load*-alternation:

(14) *Prepositional goal*



(15) *Prepositional theme*



The θ-roles in the *spray/load*-alternation (15)–(14) are parallel to those in the dative alternation (7)–(8). The ungrammatical DOC in (6a) has the PG in the goal argument, however this is possible in the thematically parallel prepositional theme in (13a). Thus, the crucial difference does not involve θ-roles, but the presence of the additional PP boundary in (13a).

3.3. It's structural distance

As discussed by Pesetsky (1995), some ditransitive verbs such as *provide* can idiosyncratically have a prepositional theme in the DOC. Here, we can observe the effect of the Minimal Distance Generalization, as a PG in the goal argument is possible even in the DOC with these verbs, as shown in (16). This shows that it is the presence of additional structure that makes the difference.

(16) Which drug$_1$ did they provide [$_{DP}$ addicts of pg_1] [$_{PP}$ *(with) t$_1$] yesterday?

In fact, embedding the licensing gap in a DOC in any additional structure is sufficient to satisfy the Minimal Distance Generalization, as (17) shows. Embedding the object licensing gap in a DP (17a), CP (17b) or TP (17c) creates the necessary structural distance to license a PG in the higher object.

(17) a. Which show$_1$ did she give [$_{DP}$ fans of pg_1] [$_{DP}$ free tickets for t$_1$] yesterday?
b. Who$_1$ did you tell [$_{DP}$ friends of pg_1] [$_{CP}$ that Mary had met t$_1$] yesterday?
c. Who$_1$ did you convince [$_{DP}$ friends of pg_1] [$_{TP}$ to go and meet t$_1$] yesterday?

A similar effect can also be seen with small clauses. The example in (18a), which involves an ungrammatical PG in the higher object of the DOC, can be improved with the addition of the verb particle *back* in (18b).

(18) a. *Which car$_1$ did you give [$_{DP}$ the owner of pg_1] t$_1$ yesterday?
b. Which car$_1$ did you give [$_{DP}$ the owner of pg_1] [$_{SC}$ t$_1$ back] yesterday?

We argue that the verb particle indicates the presence of additional structure, for example a small clause following Kayne (1984). Under the assumption that small clauses are maximal projections (e.g. Bowers's (1993) PredP), this leads to (18b) conforming to the Minimal Distance Generalization.

4. Antilocality explains the Minimal Distance Generalization

Recall the core contrast between (1) and (2), repeated below: A PG is possible in the higher argument of the PDC (19a), but not the DOC (19b).

(19) a. *Prepositional dative construction*
Who$_1$ did you give [$_{DP}$ pictures of pg_1] [$_{PP}$ to t$_1$] yesterday?
b. *Double object construction*
*Which books$_1$ did you give [$_{DP}$ fans of pg_1] t$_1$ yesterday?

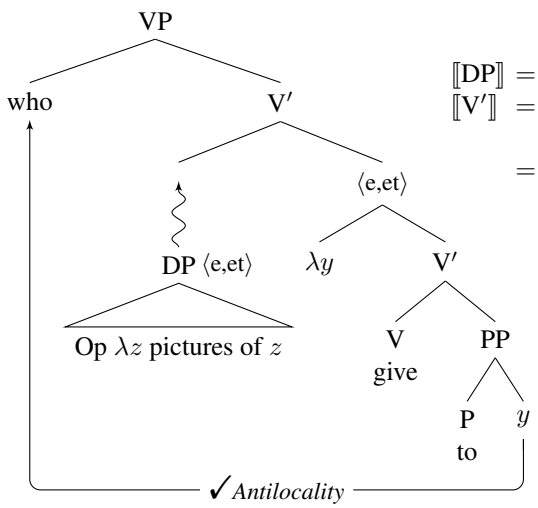
We showed in the previous section that this contrast embodies the Minimal Distance Generalization: The presence of a PP layer dominating the licensing gap in (19a) creates the necessary structural distance, which is not the case in (19b).

We propose that the Minimal Distance Generalization follows from Nissenbaum's (1998, 2000) analysis of PGs in conjunction with Abels's (2003) version of Antilocality, defined as follows:

(20) *Antilocality*
Movement must cross at least one maximal projection:
*XP$_i$ ... [α ... t$_i$ ..., unless α is a maximal projection.

Consider the derivation of the grammatical PDC in (19a):

(21)

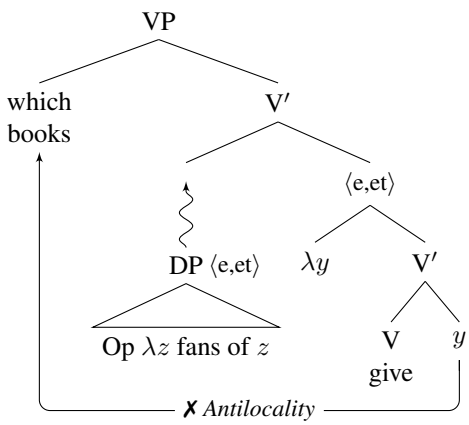


$$
\begin{aligned}
[\![\text{DP}]\!] &= \lambda z \lambda u.\ \textbf{picture-of}(u, z) \\
[\![\text{V}']\!] &= \lambda x' \lambda y'.\ [\lambda x \lambda y.\ \textbf{give}(y, x)](x')(y') \wedge \\
&\qquad\qquad [\lambda z \lambda u.\ \textbf{picture-of}(u, z)](x')(y') \\
&= \lambda x' \lambda y'.\ \textbf{give}(y', x') \wedge \textbf{picture-of}(y', x')
\end{aligned}
$$

In order for this structure to be interpretable under Nissenbaum's assumptions, the wh-phrase creating the licensing gap in the lower argument must move to a position directly above the PG-containing higher object introduced in the specifier of VP. This ensures that its sister of the correct type (⟨e,et⟩) in order to compose in a way parallel to (4). For this reason, the intermediate wh-movement step must land in the outermost specifier of VP. This step of wh-movement satisfies Antilocality, as it crosses the maximal PP projection dominating the base position of the wh-phrase.

This contrasts with the derivation of the ungrammatical DOC in (19b), shown in (22). As in the PDC in (21), the wh-phrase creating the licensing gap must move to an outer specifier of VP, but this movement violates Antilocality because of the absence of a PP layer dominating the base position of the wh-phrase.

(22) *



$$
\begin{aligned}
[\![\text{DP}]\!] &= \lambda z \lambda u.\ \textbf{fan-of}(u, z) \\
[\![\text{V}']\!] &= \lambda x' \lambda y'.\ [\lambda x \lambda y.\ \textbf{give}(x, y)](x')(y') \wedge \\
&\qquad\qquad [\lambda z \lambda u.\ \textbf{fan-of}(u, z)](x')(y') \\
&= \lambda x' \lambda y'.\ \textbf{give}(x', y') \wedge \textbf{fan-of}(y', x')
\end{aligned}
$$

It is worth emphasizing that the reason for the ungrammaticality of (22) is not due to a violation of licensing conditions on PGs. Given Nissenbaum's assumptions, the tree in (22) is interpretable in a similar way to (21). The ungrammaticality of (22) must therefore be due to some additional factor, which we identify as a syntactic constraint on the movement step creating the licensing gap.

The account also makes correct predictions for all other ditransitive examples discussed in the previous section. In all grammatical cases, the base position of the wh-phrase is dominated by a maximal projection that it must cross on its way to the specifier of VP to license the parasitic gap in the higher object.

5. Avoiding Antilocality by movement

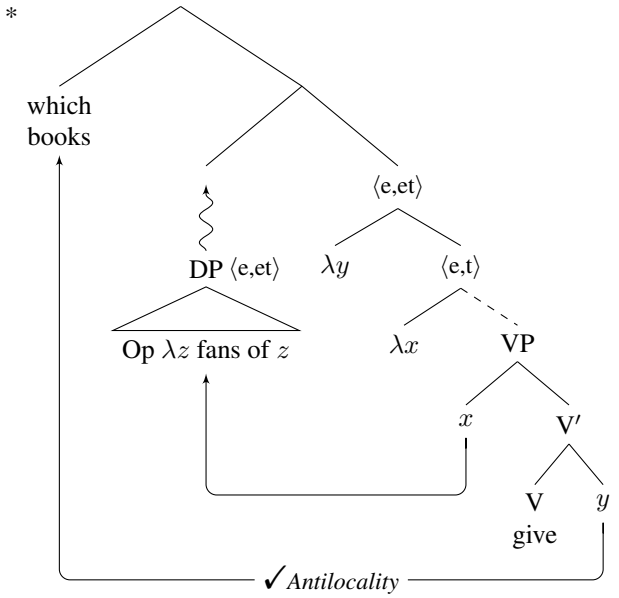
We have seen that a violation of the Minimal Distance Generalization is obviated by embedding the licensing gap in a maximal projection, such as a PP, thereby creating distance between it and the PG-containing DP. This means that the movement step to the specifier of VP required to license a PG in the higher object of a ditransitive does not violate Antilocality.

One might also expect that Antilocality can be circumvented by moving the PG-containing XP to a higher position such that the movement creating the licensing gap would not longer be too short. Indeed, this is what we find when the higher object of the DOC is passivized. Recall that the higher object of the DOC typically cannot host a PG (23a), however if this object undergoes passivization, then the PG becomes acceptable (23b).

(23) a. *Which books$_1$ did you give [fans of pg_1] t$_1$ yesterday?
b. Which books$_2$ were [fans of pg_2]$_1$ given t$_1$ t$_2$ yesterday ?

This makes sense in light of our analysis if we assume that PG-containing XPs can be interpreted in derived positions (following Nissenbaum & Schwarz 2011). In the course of passivization, the higher object moves to a position outside of the VP (this could be specifier of vP or its final landing site in the specifier of TP). As shown in (24), the wh-phrase must make an intermediate step of movement to a position directly above the passivized DP. Since the passivized object is outside VP, the movement of the wh-phrase satisfies Antilocality.

(24) *



As (24) shows, the sister to the moved DP is of the correct type (⟨e,et⟩) to allow for semantic composition.

The fact that PG-containing DPs must be able to be interpreted *ex situ* is supported by further examples involving passivization. First, consider that extraction from a passived object is typically not possible (25a) (e.g. Kuno 1973). Extraction from the *by*-phrase is possible, however (25b).

(25) a. *Who$_1$ were [$_{DP}$ friends of t$_1$] insulted [$_{PP}$ by their boss] ?
b. Who$_1$ were [$_{DP}$ your friends] insulted [$_{PP}$ by t$_1$] ?

With this in mind, consider the example in (26) where a PG in the derived subject is licensed by a licensing gap in the *by*-phrase.

(26) Who$_1$ were [$_{DP}$ friends of pg_1] insulted [$_{PP}$ by t$_1$] ?

Since the licensing gap must be in the PP, given the data in (25), the PG must be in the passivized DP. However, since this DP originates in the complement position it must be interpreted in its derived

position, as shown in (27).

(27) [who [$\overbrace{[_{DP}\ \text{Op}\ \lambda z\ \text{friends of}\ z\ ]}$ $\lambda y\ \lambda x$ [… [$_{VP}$ insult x] … [$_{PP}$ by y]]]]

If the passivized subject were interpreted in its base position, this would not give rise to an interpretable structure.

6. Consequences

In this final section, we highlight some broader consequences of our analysis of parasitic gaps in ditransitives.

6.1. Consequences for successive-cyclic movement

The first consequence involves the nature of successive-cyclic movement. Nissenbaum (2000) argued that the licensing of PGs by intermediate movement to the specifier of vP that we illustrated in section 2 provides support for the phasehood of vP (also see Legate 2003). Our findings stand to contradict this conclusion, however. The view espoused by Nissenbaum and Legate is that the phasehood of vP forces successive-cyclic movement to pass through the edge of vP. The licensing of PGs in XPs at this position serves to diagnose this movement.

In our analysis, intermediate movement must target the specifier of VP to license a PG in the higher object of a ditransitive. However, this is only possible if this movement is not antilocal. As we have seen, the lack of additional structure in the DOC means that this licensing step is not possible. However, this cannot simply be because VP is a phase. If this were the case, then extracting the DO of a DOC should be generally impossible. We would therefore predict, incorrectly, that Antilocality and the phasehood of VP would jointly rule out examples such as (28) with no PG in the higher object.

(28) What$_1$ did you give [$_{VP}$ (*t$_1$) [$_{V'}$ Mary [$_{V'}$ t$_V$ t$_1$]]] ?

In order for (28) to be compatible with Antilocality, VP cannot be a phase.

The consequence of this for our understanding of successive cyclicity is that intermediate movement steps must also be able to optionally target non-phasal projections such as VP in this case. We assume that such steps are motivated not by phasehood, but by the need to create the required licensing configuration for PGs. This line of argument is compatible with more recent claims that certain widely-accepted arguments for phasehood are compatible with the assumption of phases, but do not require it (see e.g. den Dikken 2006, Keine 2016 on vP in particular). Furthermore, it is not just that our analysis is compatible with VP being a phase, it crucially must not be, despite being a potential target for successive-cyclic movement.

6.2. Consequences for the structure of ditransitives

Our analysis of the ungrammaticality of PGs in DOCs relies on the analysis of DOCs in (8), in which the two objects of the ditransitive verb are generated within VP. More generally, our account is compatible with any view of the DOC in which the two objects are generated as codependents of the same head. This is the case, for instance, in Pylkkänen's (2008) low applicative analysis (29), but not under a high applicative account (30).

(29) *Low applicative* (Pylkkänen 2008)
[$_{VoiceP}$ Voice [$_{VP}$ V [$_{ApplP}$ IO [$_{Appl'}$ Appl DO]]]]

(30) *High applicative* (Bruening 2010)
[$_{VoiceP}$ Voice [$_{ApplP}$ IO [$_{Appl'}$ Appl [$_{VP}$ V DO]]]]

Similarly compatible with our account are analyses in which the two objects are codependents of an abstract adposition (e.g. Harley 1997, Harley & Jung 2015, Pesetsky 1995).

Furthermore, our account requires that there be a structural asymmetry between the DOC and the

PDC, such that the two DP objects in the PDC are not codependents of the same head. Our analysis is therefore compatible with theories of the ditransitive alternation such as Harley's (2002) where there is an additional PP layer in the PDC in (31b).

(31) a. $[_{vP}\ v_{\text{CAUSE}}\ [_{\text{PP}}\ \text{IO}\ [_{\text{P}'}\ \text{P}_{\text{HAVE}}\ \text{DO}\ ]]]$
b. $[_{vP}\ v_{\text{CAUSE}}\ [_{\text{PP}}\ \text{DO}\ [_{\text{P}'}\ \text{P}_{\text{LOC}}\ [_{\text{PP}}\ \text{to IO}\ ]]]]$

On the other hand, the account developed here is not compatible with symmetrical accounts such as Pesetsky's (1995), shown in (32).

(32) a. $[_{\text{VP}}\ \text{V}\ [_{\text{PP}}\ \text{IO}\ [_{\text{P}'}\ [_{\text{P}}\ G\ ]\ \text{DO}\ ]]]$
b. $[_{\text{VP}}\ \text{V}\ [_{\text{PP}}\ \text{DO}\ [_{\text{P}'}\ [_{\text{P}}\ \text{to}\ ]\ \text{IO}\ ]]]$

The distribution of PGs in ditransitives therefore provides an argument for asymmetric analyses of the dative alternation in English.

7. Conclusion

In this paper, we have discussed a restriction on PGs in ditransitives. It was shown a PG can be licensed in the higher object of the PDC, but not the DOC. Examination of a wider range of data reveals that there must be a minimal structural distance (namely an intervening maximal projection) between the PG-containing XP and the licensing gap. We derive this generalization from the combination of Nissenbaum's (2000) theory of PGs and an Antilocality constraint on movement: The licensing of a PG requires the movement creating the licensing gap to target a position immediately above the PG-containing XP, but this movement violates Antilocality in the DOC. This illicit configuration can be avoided either by embedding the licensing gap or moving the PG-containing XP. We argue that this has important consequences for the theory of successive-cyclic movement and the structure of ditransitives.

References

Abels, Klaus (2003). *Successive Cyclicity, Anti-Locality and Adposition Stranding*. Ph.D. thesis, University of Connecticut.

Bowers, John (1993). The syntax of predication. *Linguistic Inquiry* 24:4, 591–656.

Bruening, Benjamin (2010). Ditransitive asymmetries and a theory of idiom formation. *Linguistic Inquiry* 41:4, 519–562.

Chomsky, Noam (1986). *Barriers*. MIT Press, Cambridge, MA.

Culicover, Peter W. (2001). Parasitic gaps: A history. Culicover, Peter W. & Paul M. Postal (eds.), *Parasitic Gaps*, MIT Press, Cambridge, MA, 3–68.

den Dikken, Marcel (2006). A reappraisal of vP being phasal: A reply to Legate. Ms. CUNY.

den Dikken, Marcel (2018). *Dependency and Directionality*. Cambridge University Press, Cambridge.

Engdahl, Elisabet (1983). Parasitic gaps. *Linguistics and Philosophy* 6:1, 5–34.

Haegeman, Liliane (1984). Parasitic gaps and adverbial clauses. *Journal of Linguistics* 20:2, 229–232.

Harley, Heidi (1997). If you *have*, you can *give*. Agbayani, Brian & Sze-Wing Tang (eds.), *Proceedings of the WCCFL 15*, CSLI, Stanford, CA, 193–207.

Harley, Heidi (2002). Possession and the double object construction. *Linguistic Variation Yearbook* 2, 31–70.

Harley, Heidi & Hyun Kyoung Jung (2015). In support of the P_{HAVE} analysis of the double object construction. *Linguistic Inquiry* 46:4, 703–730.

Kayne, Richard S. (1984). Principles of particle constructions. Guéron, Jacqueline, Hans-Georg Obenauer & Jean-Yves Pollock (eds.), *Grammatical Representation*, Foris, Dordrecht, 101–140.

Keine, Stefan (2016). *Probes and their Horizons*. Ph.D. thesis, University of Massachusetts Amherst.

Kuno, Susumu (1973). Constraints on internal clauses and sentential subjects. *Lingusitic Inquiry* 4:3, 363–385.

Legate, Julie Anne (2003). Some interface properties of the phase. *Linguistic Inquiry* 34:3, 506–516.

Nissenbaum, Jon (1998). Derived predicates and the interpretation of parasitic gaps. Shahin, Kimary N., Susan Blake & Eun-Sook Kim (eds.), *Proceedings of WCCFL 17*, CSLI, Stanford, CA, 507–521.

Nissenbaum, Jon (2000). *Investigations of Covert Phrase Movement*. Ph.D. thesis, MIT.

Nissenbaum, Jon & Bernhard Schwarz (2011). Parasitic degree phrases. *Natural Language Semantics* 19:1, 1–38.

Pesetsky, David (1995). *Zero Syntax: Experiencers and Cascades*. MIT Press, Cambridge, MA.

Pylkkänen, Liina (2008). *Introducing Arguments*. MIT Press, Cambridge, MA.