Unbounded Successive-Cyclic Rightward DP-Movement

Abstract: Larson (1989) noted that rightward movement of a DP past a clausal adjunct can necessitate a parasitic gap inside that clausal adjunct. This paper argues that rightward DP-movement beyond certain adjunct clauses is movement beyond standard Heavy-NP Shift that is licensed by the need to bind the parasitic gap. I show that this correctly predicts a number of observations concerning the exceptional nature of the rightward movement involved. In particular, parasitic gaps are able to license rightward movement that is potentially unbounded and successive-cyclic.

Keywords: rightward movement, parasitic gaps, non-feature-driven movement, unbounded movement, successive-cyclic movement

Contents

1 Introduction

It is possible in English to displace rightward, DPs of a certain size and complexity. The example of this in (1) was explored initially by Ross (1967) as *Complex-NP Shift* but it is now commonly referred to as *Heavy-NP Shift* (HNPS).

(1)   Sam brought e_1 to the party – [the potato salad he made last week]$_1$.

Engdahl (1983:12) claims that this instance of rightward displacement is capable of licensing an additional gap in an adjunct clause as shown in (2). She classifies this additional gap as a parasitic gap (pg) of the same type licensed, for instance, by wh-movement (3).

(2)   I offended e_1 by not recognizing pg_1 immediately – [my favorite uncle from Cleveland]$_1$.
(3)   [Who]$_1$ did I offend e_1 by not recognizing pg_1 immediately?

  The puzzle we will be interested in begins with the observation by Larson (1989) that, in the case of rightward displacement, the gap in the adjunct clause is obligatory as illustrated in (4) below. Interestingly, as both Engdahl (1983) and Larson (1989) note, the same is not true of a leftward displacement counterpart like in (5). There is a sense in which the parasitic gap is optional.

(4)   * I offended e_1 by not recognizing my aunt immediately – [my favorite uncle from Cleveland]$_1$.
(5)   [Who]$_1$ did I offend e_1 by not recognizing my aunt immediately?

  In his work on this same paradigm, Nissenbaum (2000:60) formulates the generalization shown in (6) to capture the rightward displacement pattern in (2) and (4).

(6)   *Larson's Generalization*
        HNPS cannot appear to the right of a *v*P-adjunct unless that adjunct contains a PG.

Part of what I will do in this paper is argue for the following empirical generalization of the data.

(7)   *Revised Larson's Generalization*
        Rightward displacement of a DP beyond standard HNPS must result in the binding of a
        parasitic gap by the displaced DP.

The revision will be motivated in part by an argument that the displacement of the DP in cases like
(2) is actually exceptional rightward movement. Section 2 will argue that standard HNPS, which is
normally limited to the edge of *v*P, cannot cross certain clausal adjuncts because they are adjoined
to a position that is necessarily beyond the reach of HNPS. I will further argue, following a claim
by Heck & Müller (2000), that the contrast between (2) and (4) reveals that the need to provide a
binder for a parasitic gap is able to license this exceptional movement.

   Section 3 will address the claim by Postal (1994) that all structures like in (2) are derived via
Right Node Raising. After finding that at least some cases are not compatible with a Right Node
Raising analysis, section 4 further investigates this supposedly exceptional rightward movement.
We will find that this instance of rightward DP-movement is potentially unbounded in the way
Sabbagh (2007) argues is true of Right Node Raising. By examining clausal adjuncts at various
positions in the structure, we will observe that the need to bind a parasitic gap is able to license
rightward movement of a DP beyond the edge of *v*P, beyond sentential negation, and even beyond
the DP's containing clause (cf. *Right Roof Constraint*; Ross (1967)). Moreover, we will observe
that, at least in some cases, this movement is required to proceed via successive-cyclic steps.

   Section 5 then presents a formal analysis for the observations represented by the Revised Lar-
son's Generalization as well as the additional observations that are gathered in section 4. The
analysis I present draws heavily from the account for parasitic gaps in Nissenbaum 2000. I adopt
his basic representation for parasitic gap structures and suggest only a slight modification for how
such structures are derived. Essentially, the cyclic merger of the parasitic gap domain will produce
a semantic type mismatch with the matrix clause. It is the need to repair this type mismatch that
will provide the necessary motivation for movement of the DP beyond what is possible with stan-
dard HNPS. Section 6 will conclude by briefly summarizing the arguments and discussing some
of the implications of this research.

2 Revising Larson's Generalization

The requirement for an additional gap in a clausal adjunct that has been crossed by the rightward displacement of a DP is a general phenomenon in English. In addition to the *by*-clause in (2), the pattern holds for *because*-clauses (8), rationale clauses (9), temporal adverbial clauses (10), and others.[1]

(8)   Sam bought e_1 because he enjoyed [pg_1/*the cinematography] –
                                                        [the film about Bengal tigers]$_1$.

(9)   Sam brought e_1 in order to show Kim [pg_1/*the quality of his camera] –
                                        [the pictures from his vacation last summer]$_1$.

(10)   Pam burned e_1 after reading [pg_1/*the abstracts] – [every article on parasitic gaps]$_1$.

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[1]According to a number of native speakers that I have consulted, examples like (4) can be made more acceptable by replacing the full DP *my aunt* with a pronoun bound by the displaced DP. The following examples have been provided by anonymous reviewers for evaluation.

(i)   I offended e_1 by not recognizing him$_1$ – [my favorite uncle from Cleveland]$_1$.

(ii)   I offended e_1 by not recognizing him$_1$ – [every team member of the Red Socks]$_1$.

The acceptability of such examples would not obviously follow directly from the account I provide in this section or from the formal analysis that I provide in section 5. Recall from the discussion in the introduction that I will argue for an empirical generalization of the data which says that movement over one of the relevant clausal adjuncts is exceptional movement licensed by the need to provide a binder for a parasitic gap.

Assuming that these examples are acceptable, one reviewer notes that they can be made to fit with the proposed analysis if *him* is taken to be indicative of a resumption strategy employed inside the adjunct clause. In the same way that a binder must be supplied for a parasitic gap, so too could a binder be necessary for this spelled-out version of the parasitic gap. The marginality and dialectal variation that seems to surround these examples, then, could be reduced to a speaker's ability to spell-out a parasitic gap as an overt pronoun.

Another possibility is that there is more than one path to licensing exceptional rightward movement. Assume with Fox (2000) and Takahashi (2009) that movement can be licensed in the case that the result is an LF that produces a semantic interpretation that would have otherwise been unavailable. Assume further that pronoun binding is a semantic phenomenon achieved when a pronoun carries a binding index that matches the binding index of a c-commanding DP (Heim & Kratzer 1998, Büring 2005). A possibility to be entertained is that exceptional movement of a DP past one of the relevant clausal adjuncts is licensed in the case that the result is an LF in which a new binding possibility is introduced. Basically, by virtue of creating an LF with a semantic interpretation that would otherwise not be available, movement of the DPs in (i) and (ii) would be licensed. This analysis would also rule out those cases like (4) with the full DP *my aunt*. Moving over the adjunct clause in this case would not result in an LF that produces a semantic interpretation distinct from the interpretation that results from movement to a lower position. The true success or failure of this analysis, though, would depend on distinguishing these cases from other crossover phenomena, where we find that movement over a pronoun resists allowing coreference between the moved element and the pronoun.

In addition, it is worth noting at this point that examples like (2),(4)–(6), (i), and (ii) can be made more acceptable as a function of the size of the intonational boundaries that one places at each edge of the adjunct clause. The larger that the intonational boundaries around the adjunct clause are, the more parenthetical the phrase seems to become. This is an issue that warrants much more attention than I am able to afford it here. For this reason, it must be left for future research.

Of course, the rightward displacement of DPs is not categorically contingent on the presence of an additional gap. HNPS is almost defined as the displacement of a DP to the right of some PP or AdvP. Let us refer to these cases as "standard" HNPS.

(11) a. Sam met the members of his bowling team in the parking lot.
      b. Sam met e_1 in the parking lot – [the members of his bowling team]$_1$.
(12) a. Pam closed the window in the children's bedroom softly.
      b. Pam closed e_1 softly – [the window in the children's bedroom]$_1$.
(13) a. Tim wiped the grill they pulled out of the shed clean.
      b. Tim wiped e_1 clean – [the grill they pulled out of the shed]$_1$.
(14) a. Kim gave a photo collage of their trip to Argentina to her best friend.
      b. Kim gave e_1 to her best friend – [a photo collage of their trip to Argentina]$_1$.

But note that these various elements, which rightward displaced DPs seem to freely cross, are generally those elements that are fairly low in the structure. Baltin's (1981) *though*-movement diagnostic suggests that this is the case. The resistance of these adverbials to being stranded by the *though*-movement operation in the examples below suggests that they must be part of a constituent that includes the verb and which can be targeted for movement.

(15) a. [Meet his team members in the parking lot]$_1$ though he will e_1,
                          Sam is still going to get fajitas first.
      b. * [Meet his team members]$_1$ though he will e_1 in the parking lot,
                          Sam is still going to get fajitas first.
(16) a. [Close the window softly]$_1$ though she did e_1,
                          something still managed to wake the children.
      b. * [Close the window]$_1$ though she did e_1 softly,
                          something still managed to wake the children.
(17) a. [Wipe the grill clean]$_1$ though he did e_1, Tim still managed to ruin the burgers.
      b. * [Wipe the grill]$_1$ though he did e_1 clean, Tim still managed to ruin the burgers.
(18) a. [Give the photo collage to her best friend]$_1$ though she may e_1,
                          Kim is keeping the t-shirts.
      b. * [Give the photo collage]$_1$ though she may e_1 to her best friend,
                          Kim is keeping the t-shirts.

We might suppose particularly that these phrasal adjuncts are adjoined to a vP-internal position. This would be consistent with previous work on the HNPS operation which has basically settled on

the idea that it targets the first dominating *v*P node (Bresnan 1976, Stowell 1981, Johnson 1985). I will assume as much here. There is a position at the edge of *v*P that has the responsibility of hosting a DP that has undergone HNPS.[2] With this in hand, a way to make sense of the asymmetry between the adverbials in (11)–(14) and the clausal adjuncts that are subject to Larson's Generalization is through the structural height of the element being crossed. The ability of a rightward moved DP to cross a given adjunct is a function of the structural height of that adjunct relative to the locus of HNPS.[3]

This idea is schematized below in (19) and (20). The phrasal adverbials in (11)–(14) can be put into a class of Low Adjuncts that adjoin below the locus of the HNPS operation. It is for this reason that they can be freely crossed by HNPS as illustrated in (19). On the other hand, the clausal adjuncts for which Larson's Generalization holds are members of a class of High Adjuncts. They are necessarily adjoined as part of some XP that is above the locus of HNPS, as shown in (20). In a standard instance of HNPS, these particular clausal adjuncts simply cannot be crossed by a DP because HNPS cannot move a DP to a position so high up the tree.

(19) *HNPS over a Low Adjunct*
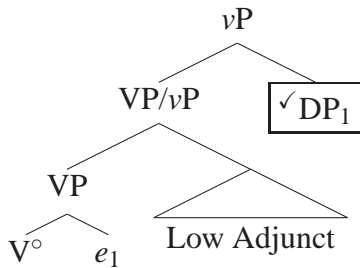
(20) *HNPS over a High Adjunct*

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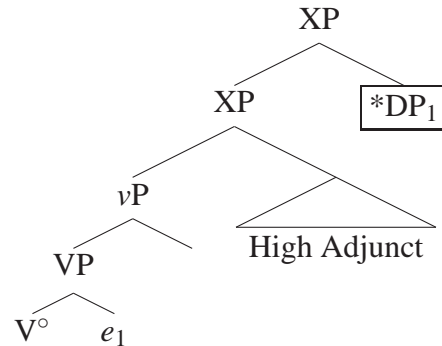
[2] I will be more precise about the nature of this position in section 5.1.

[3] This picture of the acceptability of rightward DP-movement is reminiscent of what Grosu (1973) calls the *Right Roof Constraint*. This constraint has come to represent the exceptional locality of rightward movement following Ross' (1967:307) original claim that all rightward movement is clause-bounded. Subsequent research, though, has gradually strengthened the locality conditions on rightward displacement phenomena to suggest that rightward movement of some element is in fact bound to the edge of the first cyclic node that dominates that element (e.g. Akmajian 1975, Baltin 1981, McCloskey 1999). Assuming that at least *v*P is a cyclic node, this is precisely the state of affairs that the evidence presented here has lead us to. Heavy-NP Shift cannot displace a DP beyond the edge of *v*P. We derive the effects of this constraint here by setting the necessary locus of standard HNPS as the edge of *v*P.

Some initial evidence that the adjunct clauses that are subject to Larson's Generalization are adjoined relatively high to the matrix clause can be found in the ordering restrictions that exist between them and the phrasal adverbials discussed above.[4] The following examples can be taken as evidence that clausal adjuncts are adjoined to a position in the matrix clause that is structurally higher than the relevant adverbials. Given the conclusion reached from the *though*-movement diagnostic in (15)–(18), this would locate the adjunct clauses at or beyond the edge of the *v*P-layer.

(21)   a.   Sam met his team members [in the parking lot] [after getting fajitas].
       b.   * Sam met his team members [after getting fajitas] [in the parking lot].
(22)   a.   Kim closed the window [softly] [in order to let the children sleep].
       b.   * Kim closed the window [in order to let the children sleep] [softly].

This high-attachment hypothesis is also consistent with diagnostics for attachment to the edge of *v*P. Clausal adjuncts can generally escape *v*P-ellipsis as shown in (23)–(26). This is consistent with the idea that they are not a part of the *v*P constituent.[5]

(23)   I $[_{v\text{P}}$ sang a song $]_1$ before Pam left and Kim did Δ_1 before Sue left.
(24)   Tim $[_{v\text{P}}$ brought his bagpipes $]_1$ in order to entertain the guests and
                                                  Sam did Δ_1 in order to annoy them.
(25)   Al $[_{v\text{P}}$ left $]_1$ because he was tired but Sue did Δ_1 because she was bored.
(26)   I $[_{v\text{P}}$ offended my uncle $]_1$ by not recognizing my aunt and
                                                  my brother did Δ_1 by not recognizing their dog.

The examples below in (27)–(30) with *v*P-ellipsis inside the adjunct clause support the same conclusion. The availability of a reading for the *v*P-ellipsis site under which the examples below

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[4]The high attachment of clausal adjuncts is arguably conceptually intuitive as clausal-adjuncts including *because*-clauses, rationale clauses, conditionals, temporal adjunct clauses, etc., seem to describe a relationship between two events/situations or things of a propositional nature. This basic intuition was spelled out in some detail by Johnston (1994).

[5]One might argue that adjunct clauses can also be targeted by *v*P-ellipsis based on examples like in (i) where the ellipsis site can be understood to include the adjunct clause.

(i)   I $[_{v\text{P}}$ sang a song before Pam left$]_1$ and Kim did Δ_1, too.

Following an argument in Baltin (1981:fn1), I would suggest that it is equally as plausible that the adjunct clause is merely implicit in the ellipsis site. This is supported by the example in (ii) which does not have an ellipsis site in the second conjunct yet the reading event can implicitly be understood as being modified by the same *before*-clause.

(ii)   I sang a song before Pam left and Kim read a poem.

are grammatical suggests that the adjunct clauses are adjoined no lower than an outer edge of the vP-layer. Following Sag (1976) and Williams (1977), if the clausal adjunct were internal to the matrix vP, the ellipsis site would be antecedent-contained and, therefore, uninterpretable. The identity relationship required for ellipsis could not be satisfied without resulting in the problem of infinite regress. Treating the adjunct clause as being adjoined outside of vP straightforwardly permits the ellipsis site to be resolved under identity with the matrix antecedent vP.[6]

(27)   I $[_{vP}$ sang the song $]_1$ before Sam did Δ_1.
(28)   Tim $[_{vP}$ brought his bagpipes $]_1$ so that Sam wouldn't Δ_1.
(29)   Pam $[_{vP}$ left $]_1$ because Kim did Δ_1.
(30)   Kim $[_{vP}$ scheduled the meeting $]_1$ by telling her assistant to Δ_1.

In light of what we have seen thus far, we can note that we seem to be learning something rather interesting from Nissenbaum's (2000) version of Larson's Generalization shown in (6). We are finding that an instance of exceptional rightward movement that is to a position that is otherwise inaccessible is being licensed in the event that the movement results in the binding of a parasitic gap. A more accurate description of the relevant paradigm, then, would be as shown in (31).

(31)   *Revised Larson's Generalization*
        Rightward displacement of a DP beyond standard HNPS must result in the binding of a parasitic gap by the displaced DP.

The empirical generalization that is represented by this formulation of Larson's Generalization differs from the preliminary version in (6) in that rightward movement now does not always require the creation of a parasitic gap to cross a clause. The Revised Larson's Generalization in (31) posits that the necessity of the parasitic gap is contingent on the structural height of the embedded clause.

A prediction, then, is that rightward DP-movement over a clause that is vP-internal, and therefore below the locus of HNPS, should not require an additional gap. This prediction is borne out with subject-gap purpose clauses (32), which are commonly thought to be vP-internal (Faraci 1974, Bach 1982, Huettner 1989, Jones 1991), as well as with a rationale clause that modifies the

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[6]In light of additional evidence, Fox & Nissenbaum (2003) present an alternative analysis of *before*-clauses which involvement movement of *before* and late-merger of its complement.

embedded clause of a Raising-to-Object predicate (33).[7]

(32) a. Kim [$_{VP}$ gave Pam$_1$ the camera [PRO$_1$ to take pictures of the birds]].

b. Kim [$_{VP}$ gave Pam$_1$ e_2 [PRO$_1$ to take pictures of the birds]] –
[the camera with a telescopic lens]$_2$.

(33) a. Tim expects the guy in the corner [to be a jerk in order to impress people].

b. Tim expects e_1 [to be a jerk in order to impress people] –
[the guy in the corner on his phone]$_1$.

To summarize briefly, a rightward displacement operation's contingency on a parasitic gap is itself contingent on the structural height of the clausal adjunct being crossed. It is only when the displaced DP crosses a clausal adjunct that is adjoined above the locus of standard HNPS that an additional gap becomes necessary. This characterization of the data is similar to a proposal by Heck & Müller (2000:4,9–11). *Wh*-scrambling, which is illustrated in example (34), is a (mostly) banned movement in German. Heck & Müller (2000) show with the example in (35a), though, that *wh*-scrambling can be triggered in multiple *wh*-questions by the need to bind a parasitic gap. The contrast between (35a) and (35b) further illustrates that the scrambling operation is in fact required in the presence of a parasitic gap.

(34) a. Wie$_1$ hat [$_{vP}$ der Fritz t_1 **was$_2$** repariert]?
how has ART Fritz what fixed

b. * Wie$_1$ hat [$_{vP}$ **was$_2$** [$_{vP}$ der Fritz t_1 t_2 repariert]]?
how has what ART Fritz fixed

(35) a. Wann hat die Maria **was$_1$** [$_{CP}$ ohne e_1 zu lesen] dem Fritz t_1
when has ART Maria what$_{acc}$ without to read ART Fritz$_{dat}$
zurückgegeben?
returned

b. * Wann hat die Maria [$_{CP}$ ohne e_1 zu lesen] dem Fritz$_{dat}$ **was$_1$**
when has ART Maria without to read ART Fritz$_{dat}$ what$_{acc}$
zurückgegeben?
returned

This exactly mirrors the paradigm that is represented by the Revised Larson's Generalization. In English, the need to provide a binder for a parasitic gap is necessitating an instance of rightward DP-movement that is otherwise not possible.

[7]See Postal (1974) and Bresnan (1976) for a further discussion of the ability to target the shared argument of Raising-to-Object predicates for HNPS.

In section 4 we will look at a number of predictions that such an account makes to find that a parasitic gap does in fact license exceptional rightward movement. Section 5 will then provide a formal analysis for the empirical generalizations represented by the Revised Larson's Generalization. However, because the remaining discussion relies heavily on the premise that the displacement operation we are examining is syntactic movement and the licensing of a parasitic gap, section 3 will first briefly address an alternative analysis.

3   Parasitic Gap Licensing, not Right Node Raising

Postal (1994) made an influential claim that all dependent-gap structures involving rightward displacement like in (36) and (37) are derived via the same mechanism.

(36)   *Coordinate dependent-gap structure*
         Sam bought e_1 and Kim stole e_1 – [an autographed picture of Jonathan Frakes]$_1$.

(37)   *Adjunct dependent-gap structure*
         Sam bought e_1 before Kim stole e_1 – [an autographed picture of Jonathan Frakes]$_1$.

Coordinate dependent-gap structures were originally discussed in Ross 1967 and have been referred to as *Right Node Raising* since Postal (1974).[8] Postal (1993:fn.12, 1994:80) notes that, following Engdahl (1983), it had been essentially unquestioned that adjunct dependent-gap structures are derived via rightward movement and parasitic gap licensing.[9] This is challenged directly by Postal (1994:80,96,111), who argues that adjunction structures are unable to host a parasitic gap in the second conjunct by virtue of there being no true extraction gap in the first conjunct. He suggests instead that both of the structures in (36) and (37) are derived via Right Node Raising.[10]

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[8]Right Node Raising has been analyzed as backward deletion/ellipsis (Ross 1970, Wexler & Culicover 1980, Hartmann 2000, Abels 2004, Bošković 2004, Ha 2008), Across-the-Board extraction (Maling 1972, Bresnan 1974, Postal 1974, 1998, Sabbagh 2007), and multidomination (McCawley 1982, Blevins 1990, Phillips 1996, Wilder 1999, Johnson 2007, Bachrach & Katzir 2009). The exact mechanism (or mechanisms; see Barros & Vicente 2010 and Larson 2012) behind Right Node Raising are not of immediate consequence here and so will be set aside.

[9]There are exceptions including attempts by Pesetsky (1982), Huybregts & van Riemsdijk (1985), Haïk (1985) and Williams (1990) to provide an Across-the-Board extraction analysis to both adjunct and coordinate dependent-gap structures and the attempt by Munn (1992) to provide a null-operator analysis to both structures. Postal 1993 presents extensive argumentation against any unified analysis.

[10]Space precludes reviewing the arguments presented in Postal 1994, but the conclusion is based on the observation that a number of constraints on the distribution of parasitic gaps licensed by leftward movement do not constrain the distribution of dependent gaps licensed by rightward movement in either coordinate or adjunct structures. However,

This section presents an argument which, if correct, disproves the hypothesis that adjunct and coordinate dependent-gap structures involving rightward displacement are categorically derived via a single mechanism. We will see that a constraint on the derivation of known Right Node Raising structures like (36) does not constrain the derivation of adjunct dependent-gap structures like in (37). It must be concluded from these findings that it is in principle possible for adjunct dependent-gap structures to be derived via a mechanism other than Right Node Raising.

Postal (1974), Wilder (1995, 1997, 1999) and Hartmann (2000) note that Right Node Raising is subject to a constraint that requires the displaced element to be rightmost in each conjunct before Right Node Raising can apply. This has been formalized as the *Right Edge Restriction* shown below.

(38)   *Right Edge Restriction*
        In the configuration:
        $[[_A \dots X \dots] \text{ Conj. } [_B \dots X \dots]]$
        X must be rightmost within *A* and *B* before *X* can undergo Right Node Raising.
                                            (adapted from Sabbagh 2007:355)

The following examples in (39) are adapted from Wilder 1995:288–289 and pivot on the argument structure of the ditransitive verb in the second conjunct. The Right Edge Restriction is satisfied in (39a) with the PP frame, but cannot be satisfied in (39b) with the double-object frame, which ultimately results in ungrammaticality.

(39)   a.   Tim met e_1 and gave a present to e_1 – [his best friend from college]$_1$.
        b.   * Tim met e_1 and gave e_1 a present – [his best friend from college]$_1$.

The examples in (40), then, are particularly interesting as the contrast between the two ditransitive frames is drastically reduced when we replace the coordination structure with an adjunction structure.

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as Postal (1994:fn.32) notes, it does not follow from the evidence or argumentation that a parasitic gap can*not* appear in an adjunction structure. Therefore, in as far as Postal's conclusion is a valid one, it rests on the implicit premise that only a single mechanism may target any given structure. To my knowledge, this has not been demonstrated and, therefore, the alternative hypothesis that adjunct dependent-gap structures can be derived by either Right Node Raising or parasitic gap licensing is still possible.

(40) a.   Tim met e_1 in order to give a present to e_1 – [his best friend from college]$_1$.

  b.   Tim met e_1 in order to give e_1 a present – [his best friend from college]$_1$.

Of particular interest to the argument being made here is the contrast between (39b) and (40b). It is not the case in either string that both gap positions are rightmost in their respective domains as required by the Right Edge Restriction. Yet, there is a clear contrast between these two examples such that the adjunction structure in (40b) is the more acceptable. The examples below in (41) and (42) are intended to help establish the generality of this pattern. The same contrast in acceptability arises between a coordination structure in the (a.) variants and an adjunction structure in the (b.) variants when the dependent gap is part of the double-object frame.

(41) a.   * Sam interviewed e_1 and showed e_1 his secret laboratory –
                                    [the members of the incoming class of graduate students]$_1$.

  b.   Sam interviewed e_1 before showing e_1 his secret laboratory –
                                    the members of the incoming class of graduate students]$_1$.

(42) a.   * Kim surprised e_1 and offered e_1 a raise – [everyone who showed up early]$_1$.

  b.   Kim surprised e_1 by offering e_1 a raise – [everyone who showed up early].

  This contrast between coordination and adjunction structures in this environment can be interpreted as showing that the former but not the latter are subject to the Right Edge Restriction. If this is the case, then we have fairly strong evidence to suggest that the two types of structures are not derived via the same mechanism. Moreover, it is because adjunction structures are not subject to this known constraint on Right Node Raising that some alternative analysis seems to be required. Following Engdahl (1983), Nissenbaum (2000), and others, I will continue to treat this alternative mechanism as rightward DP-movement and the licensing of a parasitic gap.[11]

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[11]Wilder (1997, 1999), Sabbagh (2007), and Kluck & de Vries (2013) have noted that rightward movement is able to feed the Right Edge Restriction. Therefore, one concern with this argument might be that an application of HNPS internal to the adjunct clause in (38) is feeding an application of Right Node Raising. The observation by Ross (1967:59) that HNPS is unable to target the first object of the double-object construction suggests that this is not the case.

  (i)   * Tim gave e_1 a present – [his best friend from college]$_1$.

This fact rules out a Right Node Raising analysis for adjunction structures (40b) and is what blocks the application of Right Node Raising in coordination structures (39b).

4   Parasitic Gaps, Unboundedness, and Successive-Cyclicity

I suggested above, following a proposal by Heck & Müller (2000), that the need to provide a binder for a parasitic gap licenses rightward movement beyond standard HNPS. In this section, I provide further evidence that this rightward movement, given common conceptions, is in fact exceptional. Section 4.1 shows that the need to bind a parasitic gap licenses movement beyond the *v*P and in fact beyond the containing clause. Section 4.2 argues that this movement can also potentially proceed successive-cyclically.

4.1   *Potentially Unbounded Rightward DP-Movement*

Perhaps the most well-known difference between leftward and rightward movement is that rightward movement appears to be subject to much stricter locality conditions than leftward movement. This makes the idea that a parasitic gap licenses rightward movement beyond standard HNPS, and thus beyond the *v*P, an intriguing one. It naturally raises the question of how much further rightward movement licensed by a parasitic gap can go. The evidence presented here will suggest that rightward movement is in fact potentially unbounded, just like its leftward counterparts.

First, to my knowledge, it was observed by Lakoff (1970) that the scope of a *because*-clause is ambiguous with respect to negation (43).

(43)   Sam didn't leave because he was tired.
    a.   CAUSE $>$ ¬
           "Because Sam was tired, it's not the case that he left."
    b.   ¬ $>$ CAUSE
           "It's not the case that, because Sam was tired, he left."

Relevant to the point being made here is that a parasitic gap in a *because*-clause interpreted above negation can license movement of a DP as in (44). This example has been designed to be biased towards the wide-scope interpretation of the *because*-clause and to block a Right Node Raising derivation with a double-object construction (see section 3). Furthermore, we can note that the parasitic gap is necessary to license the movement.

(44)   Tim didn't [$_{vP}$ invite e_1] because he would have to give [pg_1/*everyone] a gift –
                                            [the guy who throws such extravagant parties]$_1$.
        "Because Tim would have to give [him/everyone] a gift, she didn't invite the guy who
        throws such extravagant parties."

I am assuming that because the adjunct clause is interpreted above negation it was generated there. This means that the movement of the DP past this clausal adjunct has not only taken the DP beyond the edge of vP, but even beyond sentential negation.

We can demonstrate that this is indeed what we are observing by placing a negative polarity item (NPI) inside the rightward displaced DP. First, note that an NPI such as *any* remains licensed in a DP that has undergone standard HNPS (45). This is consistent with our findings above that standard HNPS targets the first dominating vP.

(45)   a.   Tim doesn't invite any of his superiors in the department department to parties.
        b.   Tim doesn't invite e_1 to parties – [any of his superiors in the department]$_1$.

Let us simply assume for the moment that the movement licensed by a parasitic gap targets a position immediately above the parasitic gap domain.[12] Given the available attachment sites for the *because*-clause either above or below negation, it should be possible to predict when a negative polarity item will be licensed following movement that is driven by a parasitic gap.[13] If the *because*-clause takes scope below negation (46), *any* should in principle be licensed in the derived position above the adjunct clause.[14] On the other hand, if the *because*-clause takes scope above

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[12]What follows will support this assumption. Basically, I am assuming the representation for parasitic gaps proposed in Nissenbaum 2000:ch.2, which will be discussed in more detail in section 5.

[13]Also relevant to the discussion here is the observation by Mayr & Spector (2010) that (potentially string-vacuous) HNPS may result in otherwise unavailable wide-scope readings of a universal quantifier with negation. This is a potential counter-example to the claim that HNPS targets a relatively low position in the structure. However, given their basic analysis for these observations based on *Scope Economy* principles (Fox 2000), the facts are not incompatible with the system being built here. Thus, a similar argument to the one here could be made whereby it is predicted that a parasitic gap in an adjunct clause above negation forces a wide-scope reading for a universal quantifier. Because these judgements are more involved and less stable, they are not included here. Instead, I thank Jeremy Hartman (p.c.) for suggesting that I use the NPI diagnostics presented here.

[14]It is sometimes claimed that NPIs are simply unlicensed in the matrix clause given a low-scope *because*-clause (Johnston 1993, Chierchia 2004, Hsieh 2009). The usual account comes from Linebarger's *Immediate Scope Constraint* which asserts that an NPI and its licensor must not be separated by another logical element. However, as Linebarger (1987:339–340) and Guerzoni (2006:372–374) note, the acceptability of examples like (48a), which is based on examples in Partee 1993, is predicted by allowing the negative polarity item to be licensed by covertly raising to a position between negation and the *because*-clause and avoiding a violation of the Immediate Scope Constraint. The key, as (48a) shows, is that these readings require a partitive/specific interpretation of the shifted quantificational
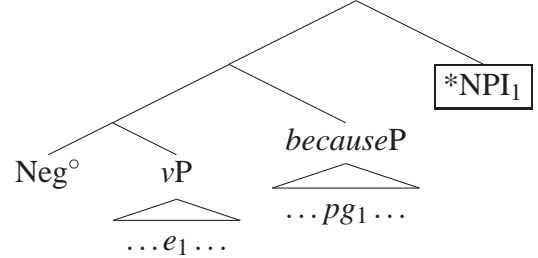
negation (47), *any* should fail to be licensed following the displacement operation as its derived position will be outside the scope of negation.

(46) *Movement over a low* because-*clause*   (47) *Movement over a high* because-*clause*

$$\text{Neg}^{\circ}\quad\quad\quad\checkmark\text{NPI}_1$$

*v*P   *because*P

$\ldots e_1 \ldots$ $\ldots pg_1 \ldots$

$$*\text{NPI}_1$$

*because*P

Neg$^{\circ}$ *v*P $\ldots pg_1 \ldots$

$\ldots e_1 \ldots$

These predictions are borne out in (48) and (49) respectively. The (a) variants provide the source example and its interpretation while the (b) variants provide the string that results from rightward movement and the licensing of a parasitic gap. The example in (48) contains a *because-*clause biased towards scoping below negation. With this interpretation, the rightward displaced NPI remains licensed in (48b), which suggests that its derived position is below negation as diagrammed in (46). The more interesting case for our purpose is in (49). Here, like in (44), the *because*-clause is biased towards taking scope over negation. Rightward displacement of the DP with this interpretation of the *because*-clause, though, is now no longer acceptable. This is expected if this sentence necessarily has the structural configuration in (47) where the NPI has moved above the *because*-clause and, therefore, outside of negation.

(48) *Context*: Tim wants to give the superiors in his department presents if they come to his parties. But, it's not for this reason that he invites any of them to his parties.

    a.   Tim doesn't invite any of the superiors in his department because he wants to give them a present.
$\neg\exists x[\text{co-worker}(x) \wedge \text{CAUSE}(\text{invite}(x,\text{Tim}), \text{give-them-a-present}(\text{Tim}))]$
"It's not the case that there is an x such that x is a superior and because Tim wants to give them a present, he invites them."

    b.   Tim doesn't invite e_1 because he wants to give pg_1 a present –
                     [any of the superiors in his department]$_1$.

DP (e.g. Enç 1991, Diesing 1992). It is interesting to note that this is exactly the configuration and interpretation achieved by the rightward displacement operation illustrated in (46).

(49) *Context*: Tim has to give the superiors in his department a present if they come to his
      parties. For this reason, he doesn't invite any of them to his parties.
    a. Tim doesn't invite any of the superiors in his department because he has to give
        them a present.
        CAUSE($\neg\exists x$[co-worker(x) $\wedge$ invite(x,Tim)], hate-them(Tim))
        "Because Tim has to give them a present, it's not the case that there is an x such that
        x is a superior and Tim invites x."
    b. * Tim doesn't invite e_1 because he has to give pg_1 a present –
                                                    [any of the superiors in his department]$_1$.

A more dramatic example of exceptional rightward movement can be found in (50), which is
adapted from Nissenbaum 2000:89. Here we see a rationale clause modifying the matrix predicate
claim but the rightward displaced DP has its base position as the complement of the embedded
verb *like*. As expected from the Revised Larson's Generalization, a parasitic gap in the rationale
clause is necessary to license the movement of the DP.

(50)   I claimed [$_{CP}$ that I liked e_1] in order to get you to rent [pg_1/*a VHS cassette] –
                                        [that movie with Fred Astaire and Audrey Hepburn]$_1$.

Examples like this suggest that, contra Ross 1967, rightward movement is not necessarily clause-
bounded. The structurally similar example below in (51) shows that the same pattern emerges
when a Right Node Raising derivation is blocked with the double-object construction.

(51)   Sam thinks [$_{CP}$ that you like e_1] because he saw you give [pg_1/*someone] a present –
                                        [one of the co-workers in your department]$_1$.

These observations in conjunction with the more basic instances of exceptional rightward
movement identified in section 2 and section 3 demonstrate that rightward DP-movement can tar-
get positions beyond the immediate vP that contains the relevant DP and even positions external to
that DP's containing clause. This naturally suggests that a DP could be rightward moved a theo-
retically unbounded distance from its base-generated position. Doing so, though, requires that the
movement is appropriately licensed, which I have argued can be achieved by the need to bind a
parasitic gap.

4.2 Successive-Cyclic Rightward DP-Movement

Having seen in the previous subsection that rightward DP-movement is potentially unbounded when licensed by a parasitic gap, the next question that arises is how this movement proceeds to its final landing site. It could proceed by way of successive-cyclic operations of movement, as is often thought to be the case for leftward movements (e.g., Chomsky 1973, 1977), or it could proceed via a single long-distance step, as Sabbagh (2007) claims is possible for instances of Right Node Raising of a DP that are amenable to an Across-the-Board extraction analysis.

4.2.1 Multiple Parasitic Gap Domains

There is evidence suggesting that parasitic gaps license rightward DP-movement that can proceed in a successive-cyclic fashion and that in some cases it must do so. Consider the sentences in (52) which have been modeled on examples from Nissenbaum 2000:64.

(52)   a.   Kim promoted e_1 without calling $[pg_1]$ because she wanted to give $[pg_1]$ a raise –
[the guy with a reference from Al Gore]$_1$.

b.   * Kim promoted e_1 without calling [management]
because she wanted to give $[pg_1]$ a raise –
[the guy with a reference from Al Gore]$_1$.

c.   * Kim promoted e_1 without calling $[pg_1]$
because she wanted to give [someone] a raise –
[the guy with a reference from Al Gore]$_1$.

d.   * Kim promoted e_1 without calling [management]
because she wanted to give [someone] a raise –
[the guy with a reference from Al Gore]$_1$.

Nissenbaum notes of such examples with multiple adjunct clauses that a parasitic gap is required in each adjunct that has been crossed by the displaced DP.[15] I will abstract away from the details until section 5.2, but for Nissenbaum (2000:ch.2), HNPS of the DP in (53a) licenses the counter-cyclic adjunction of a parasitic gap domain $\boxed{\text{XP}}$ immediately below the landing site of the displaced DP as in (53b).

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[15]Nissenbaum (2000:92) suggests that a gap is not necessary in each adjunct when the adjunct clauses modify different clauses. However, I do not share this judgement.

(53) a.

vP

vP DP_1

$v°$ VP

$V°$ e_1

b.

vP

vP XP DP_1

$v°$ VP $\ldots\, pg_1\, \ldots$

$V°$ e_1
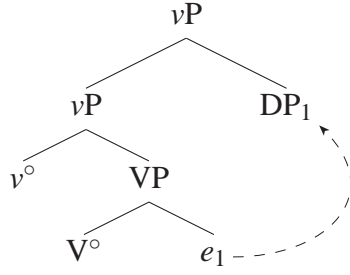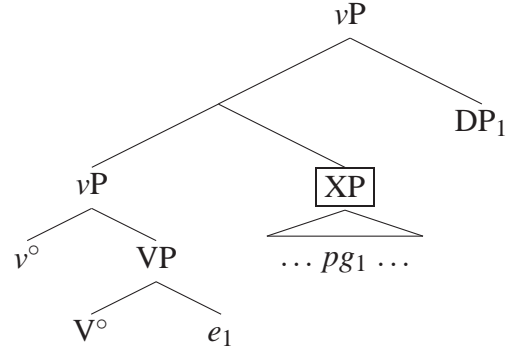
In the case that the adjunct clause is not a parasitic gap domain, it must be merged cyclically above the displaced DP as counter-cyclic merger would not be licensed. Therefore, any and all adjunct clauses that appear to the left of a displaced DP, must have been counter-cyclically merged there and, thus, must be a parasitic gap domain. It is this way, in fact, that Nissenbaum accounts for the preliminary version of Larson's Generalization in (6).

It was argued in section 2, however, that HNPS cannot target a position in the structure that is higher than the lowest point of attachment for adjunct clauses that are subject to the Revised Larson's Generalization. Instead, the need to bind a parasitic gap is licensing exceptional rightward movement, which we saw above in section 4.1 can target positions well beyond the reach of standard HNPS. For the system in Nissenbaum 2000 to work alongside these observations, global economy considerations would have to license the additional DP-movement beyond HNPS by looking ahead to the necessity of counter-cyclically merging the parasitic gap domain into the structure. There would be no local requirement at the relevant point in the derivation to motivate an instance of rightward DP-movement to a position that is otherwise inaccessible.

However, this is incompatible with the observations in (52). If global economy considerations licensed the relevant movement and tucking-in of the adjunct clauses were freely available, it would be predicted that movement over an adjunct clause without a parasitic gap would be licensed by the presence of a parasitic gap in a higher adjunct clause. But, as (52b) reveals, this is not the case. In light of the claim that the need to bind the parasitic gap licenses exceptional movement, examples like (52b) suggest instead that each instance of movement over each adjunct clause must

independently be licensed. This in turn means that the displaced DP must move through a position above each individual parasitic gap domain. (I will return to why this should necessarily be the case in sections 4.2.2 and 5.2.)

This has been a primarily conceptual argument up to this point, but it can be demonstrated that the rightward displacement of interest must in some cases proceed successive-cyclically. The example in (54) shows that it is possible for a parasitic gap to simultaneously appear in an adjunct clause below negation and in an adjunct clause above negation.

(54)   a.   Tim didn't invite e_1 before meeting pg_1 because he didn't want to give pg_1 a present
        $-$ [the person they just hired in accounting]$_1$.
       "Because Tim didn't want to give that person a present, it's not the case that he invited him before meeting him."

   b.

In the same way as in the previous subsection, the displaced DP must have ultimately moved beyond the *v*P and sentential negation to its final landing site above the *because*-clause. Recalling that the height of a parasitic gap domain is symptomatic of the height of the binder for the parasitic gap (48)/(49), the displaced DP must have also moved through a position below negation where the *before*-clause is interpreted. If the displaced DP had undergone a single operation of movement only to a position either above or below negation, then one of these adjunct clauses could not be

interpreted in a position that correctly reflects its scope with negation. Thus, this example resists a non-successive-cyclic analysis of the movement operation. The moved DP must have moved through a position below negation where the *before*-clause with a parasitic gap could be interpreted and above negation where the *because*-clause with a parasitic gap could be interpreted.

4.2.2 An Apparent Paradox

Taking stock, we have seen that parasitic gaps license movement beyond standard HNPS and the presence of multiple parasitic gaps will force this movement to proceed successive-cyclically. On the other hand, movement beyond standard HNPS in the absence of a parasitic gap is unlicensed and ungrammatical. Nissenbaum's examples of long-distance rightward movement in (50) and (51), then, could be seen as potentially problematic. In a system that forces the successive-cyclicity of movement with a principle like Subjacency (e.g., Chomsky 1973, 1977, 1986, Akmajian 1975, Baltin 1981) or an EPP-feature in a contemporary phase-based approach (Chomsky 2000), there would be no non-stipulative local economy requirement for movement of the DP beyond the standard HNPS operation to the edge of the embedded clause. This presents a paradox wherein (52) shows us that the relevant movement must be successive-cyclic while (50) and (51) suggest that this movement need not proceed successive-cyclically.

The paradox is only apparent, however, as both of these positions can be accommodated by following the claim in Abe (1993:173–176) and Fox & Pesetsky (2005) generally, as well as Sabbagh (2007) with respect to rightward movement in particular, that $\overline{\text{A}}$-movement need not necessarily proceed successive-cyclically.[16] That is, successive-cyclicity is not an inherent property of syntactic movement. Instead, independent principles of the grammar may require that certain instances of movement proceed successive-cyclically.

To account for the data at hand, let us follow Sabbagh's 2007 analysis of Right Node Raising by adopting the theory of Cyclic Linearization proposed by Fox & Pesetsky (2005). This system starts with the proposal by Bresnan (1971), Uriagereka (1999), Chomsky (2000), and Epstein & Seely

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[16]See also den Dikken (2009) and references therein for a discussion of the non-existence of successive-cyclic movement through Spec,CP.

(2002) that derivations proceed cyclically via multiple spell-outs of the syntactic object under construction. When a so-called spell-out domain (roughly one of Chomsky's 2000 phases: *v*P, CP) is sent to the phonological component, the relative linear ordering of each syntactic element is established and compiled as a list. As each new spell-out domain is spelled out, another set of linear ordering statements is established and compiled. As per the principle below, ordering statements can only be added to the list.

(55)   *Order Preservation*   (Fox & Pesetsky 2005:6)
       Information about linearization, once established at the end of a given Spell-out domain,
       is never deleted in the course of a derivation.

Because ordering statements cannot be deleted, then if an ordering statement established in one instance of spell-out contradicts an ordering statement established in a preceding instance of spell-out, linearization will fail. An unambiguous (or *antisymmetric* following Kayne (1994)) ordering of the syntactic elements involved could not be produced. This means that no PF representation could be assigned to the syntactic object, the structure would become unpronounceable, and therefore would be an illicit syntactic object.

To briefly illustrate, assume that α and β are spell out domains. At the point in the derivation when the first spell-out domain α has been completely constructed (56a), it will be spelled out and among the list of linearization statements collected will be $A < X$ (read as A precedes X). If in the derivation of the higher spell-out domain β (56b), X moves out of α over A into β, then X will precede α and everything in it at the spell-out of β. The linearization algorithm then will produce the ordering statement $X < A$, which contradicts the ordering of these two elements that was previously established. This makes β an illicit syntactic object as it cannot be assigned a legitimate PF representation.

(56)   a. $[_\alpha \text{ A X }]$ b.   * $[_\beta \text{ X } [\text{ B } [_\alpha \text{ A } \text{X}]]]$
            Spell-out of α: $A < X$ Spell-out of α: **A** < **X**
                                                                     Spell-out of β: **X** < B < **A**

Movement out of spell-out domains is of course possible and is permitted in this theory by requiring that X moves to the edge of α before spell-out (57a). In this case, the ordering statement

$X < A$ is established at the spell-out of α. Further movement of X into β then does not contradict the previously established ordering statement at spell-out of β (57b).

(57)   a. $[_\alpha \text{ X } [\text{ A } \text{X}]]$
                   Spell-out of α: $X < A$

               b. $[_\beta \text{ X } [\text{ B } [_\alpha \text{ X } [\text{ A } \text{X}]]]]$
                   Spell-out of α: $\mathbf{X < A}$
                   Spell-out of β: $\mathbf{X < B < A}$

In this way, spell-out forces movement to proceed successive-cyclically through the edge of a spell-out domain. But, for any given instance of movement, this is only in the case that the movement will alter the linear order of the syntactic elements in that spell-out domain.

With this in mind, rightward movement of X will not necessarily need to move through the edge of α. Consider (58) in which the linear order $A < X$ collected at the spell-out of α will be preserved at the spell-out of β regardless of whether or not X moves through the edge of α. As Sabbagh (2007:581–582) argues, it is true for Right Node Raising, as it is for any instance of movement, that non-successive-cyclic long-distance movement should in principle always be possible given that there are "no other specific constraints on [that instance of] movement."

(58)   a. $[_\alpha \text{ A X }]$
                   Spell-out of α: $A < X$

               b. $[_\beta [[_\alpha \text{ A } \text{X}] \text{ B }] \text{ X }]$
                   Spell-out of α: $\mathbf{A < X}$
                   Spell-out of β: $\mathbf{A < B < X}$

This is exactly how we account for the examples of long-distance rightward movement from (50), which has been repeated as (59) below. When there is only a single parasitic gap licensing movement, it will in principle be possible for this movement to proceed non-successive-cyclically across a clause boundary as nothing forces it to make any intermediate stops.

(59)   Sam thinks $[_{CP}$ that you like $e_1]$ because he saw you give $[pg_1/$*someone$]$ a present –
                                          [one of the co-workers in your department$]_1$.

Let us consider the derivation of this example with the assumption that vP and CP are spell-out domains. The first stage in the derivation, which is shown in (60a), has the embedded $v\text{P}_1$ constructed and spelled-out. The next two stages of the derivation, which are both represented by (60b), will see the embedded CP_1 and the matrix $v\text{P}_2$ constructed and spelled-out. At this point,

DP$_1$ will have remained inside the embedded vP$_1$ seeing as there has been no motivation provided to do otherwise. In (60c) we finally reach the point in the derivation when the parasitic gap domain is adjoined to the matrix and movement of the DP$_1$ is licensed in order to provide a binder for the parasitic gap. Because DP$_1$ had not previously been ordered with respect to the *because*-clause, the two may freely permute so long as no other ordering statements are contradicted in the process. (Example (61) below shows an instance where this additional condition is not met.)

(60)   a.   [$_{vP_1}$ you like [$_{DP}$ one of the co-workers …]$_1$]
                  Spell-out of vP$_1$: you < like < DP$_1$

       b.   [$_{vP_2}$ Sam thinks [$_{CP}$ that you [$_{vP_1}$ like [$_{DP}$ one of the co-workers …]$_1$]]]
                  Spell-out of vP$_1$: you < like < DP$_1$
                  Spell-out of CP$_1$: that < you < like < DP$_1$
                  Spell-out of vP$_2$: Sam < thinks < that < you < like < DP$_1$

       c.   [$_{CP_2}$ Sam [$_{vP}$ thinks [$_{CP}$ that you [$_{vP}$ like e_1]]]
                          because he saw you give pg_1 a present [one of the co-workers …]$_1$]
                  Spell-out of vP$_1$: you < like < DP$_1$
                  Spell-out of CP$_1$: that < you < like < DP$_1$
                  Spell-out of vP$_2$: Sam < thinks < that < you < like < DP$_1$
                  Spell-out of CP$_2$: Sam < thinks < that < you < like < *because*P < DP$_1$

Of course, this type of long-distance non-success-cyclicity is not compatible with the common treatment of movement as a result of an Agree relationship (Chomsky 2000, 2001). It is typically thought that Agree is a necessarily local operation that is unable to target elements across vP and CP layers (e.g., the *Phase Impenetrability Condition*; Chomsky 2001). However, I will claim in the following section that the movement operation, which we have thus far treated as being motivated by the need to bind the parasitic gap, is in fact non-feature-driven movement. Thus, the step of movement over the adjunct clause is not triggered by an Agree relationship and should not necessarily be subject to the same locality conditions that constrain the trigger for what are considered feature-driven movements.

Accounting for the examples in (52a) and (54), which have multiple parasitic gap domains that trigger successive-cyclic movement, will require something extra. Let us suppose, in the terms of Sabbagh (2007), that there is an additional constraint on this instance of rightward movement.

In particular, assume that there is a constraint requiring that each parasitic gap is independently provided a binder. I will motivate this constraint below in section 5.2, but, for the time being, this is what requires rightward movement of a DP beyond standard HNPS to proceed through any and all positions in which it would provide a binder for a parasitic gap (see section 4.2.1). Therefore, as long as the rightward movement operation does not result in any contradictory linearization statements, movement of the DP will be potentially unbounded and will proceed through a position immediately above each parasitic gap domain exactly as illustrated in (54b).

At this point, though, it is still not clear how (52b) would be ruled out. I have argued that non-successive-cyclic long-distance movement is possible and, given only a single parasitic gap domain, nothing will require the rightward moved DP to stop at any intermediate position. A way of blocking this movement within the system being proposed is to assume an enriched inventory of nodes that count as spell-out domains and that the types of adjunct clauses that are subject to the Revised Larson's Generalization simply reside in separate spell-out domains. The effect is that the step of movement that occurs in (52b) is properly licensed by the need to bind a parasitic gap, but it produces contradictory linearization statements in the course of the derivation.

Consider the derivation of (52b), which is illustrated below in (61), to see how this is the case. The first step of the derivation in (61a) shows the point at which the vP has been built and spelled out. The stage of the derivation in (61b) is the point at which the spell-out domain containing the lower adjunct clause has been built. Because there is no parasitic gap in the *without*P requiring a binder, movement of the DP is unlicensed at this point and it will remain in the vP. At spell-out, then, an ordering statement will be gathered stating that the DP precedes the *without*P. The example in (61c) shows the point at which the spell-out domain containing the higher adjunct clause has been built. The *because*P is a parasitic gap domain and, therefore, movement of the DP is licensed to a position above the *because*P. However, at spell-out, an ordering statement will be collected which says that the *without*P precedes the DP. The resulting contradictory ordering statements ultimately render the structure ungrammatical.

(61)   * Kim [$_{YP}$ [$_{XP}$ [$_{v}$P hired e_1] without calling management] because she trusted pg_1]

– [the guy with a reference from Al Gore]$_1$.

a. $[_{vP}$ Kim hired $[_{DP}$ the guy ... $]_1]$
   Spell-out of vP: Kim $<$ hired $<$ DP$_1$

b. $[_{XP} [_{vP}$ Kim hired $[_{DP}$ the guy ... $]_1]$ without calling management $]$
   Spell-out of vP: Kim $<$ hired $<$ DP$_1$
   Spell out of XP: Kim $<$ hired $<$ DP$_1 <$ *without*P

c. $* [_{YP} [_{XP} [_{vP}$ Kim hired $e_1]$ *without*P $]$ because she trusted pg_1 $[_{DP}$ the guy ... $]_1]$
   Spell-out of vP: Kim $<$ hired $<$ DP$_1$
   Spell-out of XP: Kim $<$ hired $<$ **DP**$_1 <$ ***without*P**
   Spell-out of YP: Kim $<$ hired $<$ ***without*P** $<$ *because*P $<$ **DP**$_1$

In short, by not being able to move to the edge of the spell-out domain containing the lower adjunct clause (given the lack of a parasitic gap) a set of contradictory ordering statements are produced by any subsequent rightward movement. Looking back, it is because the rightward movement in (52a) and (54) moves through the edge of each spell-out domain to provide a binder for each parasitic gap that contradictory linearization statements are avoided.

We arrive at point, then, where the rightward DP-movement of interest is not inherently successive-cyclic, but will proceed successive-cyclically when this is made necessary by independent requirements in the grammar. What we have seen in particular is that this rightward movement might proceed successive-cyclically in order to meet its licensing conditions and, as an effect, this facilitates the linearization of the displaced element.

5 Licensing Rightward DP-Movement

This section presents a formal account of the Revised Larson's Generalization, which has been repeated for convenience, and the results of the previous section.
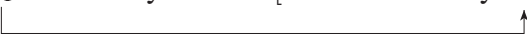
(62) *Revised Larson's Generalization*
   Rightward displacement of a DP beyond standard HNPS must result in the binding of a parasitic gap by the displaced DP.

Section 5.1 spells out a theory for HNPS that captures the fact that rightward DP-movement generally cannot cross the clausal adjuncts that are subject to the generalization in (55). Section 5.2

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provides a system and formal analysis for those instances where a parasitic gap licenses what is otherwise impossible rightward movement. The actual mechanics are adapted largely from Nissenbaum 2000 and involve the movement of the DP repairing a type-mismatch between the matrix clause and the parasitic gap domain.

5.1 When Heavy-NP Shift Is Unlicensed

We will start by treating standard instances of HNPS like in (56) as an operation involving rightward movement of the DP (Ross 1967:56).[17]

(63)   Sam bought e_1 on the way home – [the documentary about Bengal tigers]$_1$.

Rochemont & Culicover (1990), building on Rochemont (1986), argue that a DP that has been targeted for HNPS receives a focus interpretation.[18] The following question-answer pairs are adapted from Rochemont & Culicover (1990:24) where they are presented as evidence for this claim.

(64)   a. Q: What did John purchase for his wife?
            A: John purchased for his wife – a brand new fur coat.
        b. Q: For whom did John purchase a brand new fur coat?
            A: # John purchased for his wife – a brand new fur coat.

We see from these examples that a HNPS configuration provides a felicitous answer to the question in (64a) but not to the question in (64b). The contrast can be explained by assuming that this peripheral position in which we find the DP *a brand new fur coat* is reserved for "new" or "non-given" information, roles played by focused elements. It is for this reason that the relevant information for a *wh*-question can appear in this position (64a). On the other hand, as part of the

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[17]This analysis contrasts with the "predicate raising" analysis in Larson (1989), the "stranding analysis" in Kayne (1994), and the "remnant movement" analyses in Rochemont & Culicover (1997).

[18]It is important to acknowledge that research by Arnold et al. (2000), Wasow & Arnold (2003) and others have demonstrated that structural complexity can motivate rightward displacement independent from the discourse status of the displaced element. This supports the claim by Saito & Fukui (1998) that HNPS is a post-syntactic operation. While I agree that such rightward displacement lacking semantic import is arguably a post-syntactic phenomenon, the discovery that such examples exist does not in itself prove that rightward displaced elements can never be the result of syntactic movement. Furthermore, given the evidence presented in the previous section and the observation that this movement can have information-structural effects, at least some cases of rightward displacement must place in the syntactic component.

questioned material in (64b), *a brand new fur coat* is in the conversational background. Therefore, it cannot play the role of focused material and, thus, is incompatible with the information-structural requirements on this peripheral position.

Assuming the interpretation of these observations to be correct, I will treat standard HNPS as a discourse-configurational structure (e.g., Kiss 2002) and assume that discourse roles like Focus can be represented in the syntax (e.g. Rizzi 1997). This makes standard instances of HNPS an instance of focus-driven movement whereby the displaced DP moves to a low focus dedicated position in an articulated *v*P layer (e.g. Larson 1988, Marantz 1993, Belletti 2001, Merchant 2013). The sentence in (63), then, will have the partial representation in (65).

(65)
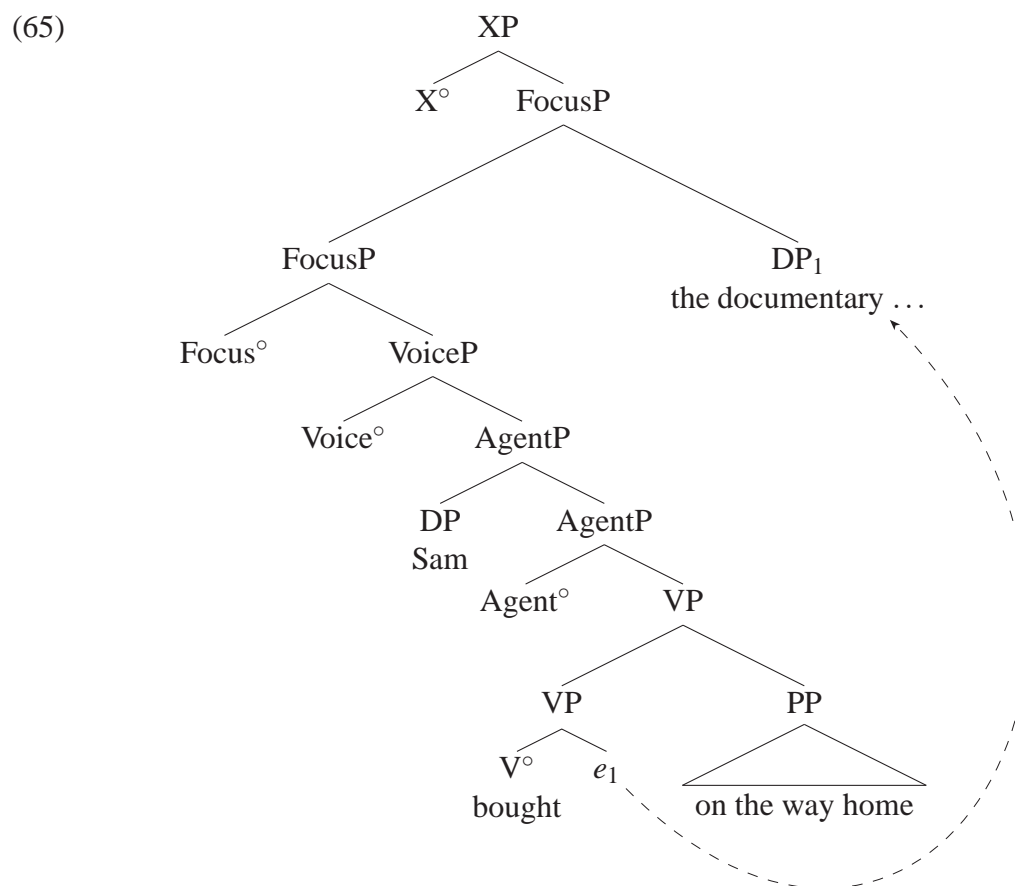
The standard of treatment for such instances of movement would propose that it is driven by the need of the DP to check a feature on Focus° (Chomsky 1995, 2001).[19] Having found empirically

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[19]Specific versions of a feature-driven approach to focus movement have been proposed by Brody (1995) and Horvath (2007). Alternative analyses, such as the one offered by Szendröi (2003), suggest that focus movement is prosodically-driven. For a theory of focus movement that relies on the satisfaction of requirements at LF see Kiss

in section 2 that this low focus position marks the upper-bound of how far standard HNPS may displace a DP, then something along the lines of the *Activity Condition* (Chomsky 2001) could be invoked to disallow further movement.

The node XP in the structure above represents an additional extended verbal projection (e.g., Grimshaw 1991, 1993). For the purposes here, this position is necessarily above the low FocusP that hosts standard HNPS and represents the lowest available point of attachment for a clausal adjunct that is subject to the Revised Larson's Generalization. Because standard HNPS beyond Spec,FocusP is unlicensed, and because clausal adjuncts necessarily adjoin above FocusP, we derive the fact that rightward displacement of DP that is moving solely for focus will be unable to target a position above a clausal adjunct that is subject to the Revised Larson's Generalization. Consider the sentence in (66a) and its simplified partial representation in (66b) to see this. Much like we saw in (20), movement of the direct object that is purely for the purpose of focus is licensed as far as Spec,FocusP. But an operation of movement that takes the DP any further, including over this particular clausal adjunct, is unlicensed in the absence of any additional motivation.

(2009).

(66) a. * Sam bought e_1 because he loved the cinematography
                          – [the documentary about Bengal tigers]$_1$.

b.
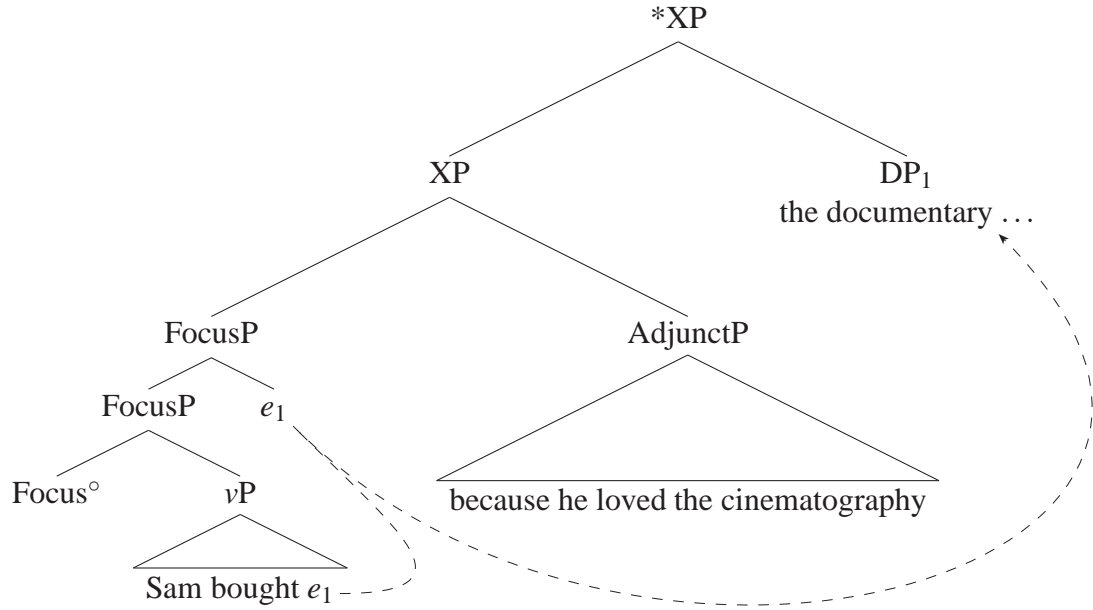
5.2 *When Rightward DP-Movement Repairs a Type-Mismatch*

We can turn now to why it is that further rightward movement beyond Spec,FocusP and past the relevant clausal adjuncts is permitted in the presence of a parasitic gap. I will suggest that it is the need to repair a semantic type mismatch between the parasitic gap domain and the matrix clause that licenses the movement.
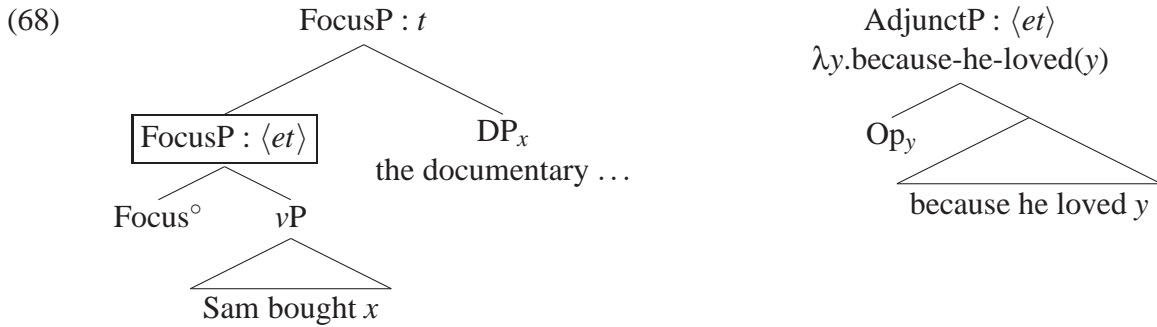
I will be adapting the analysis that was proposed by Nissenbaum (2000:ch.2) for parasitic gap licensing in examples like (67).

(67)   Sam bought e_1 because he loved pg_1 – [the documentary about Bengal tigers]$_1$.
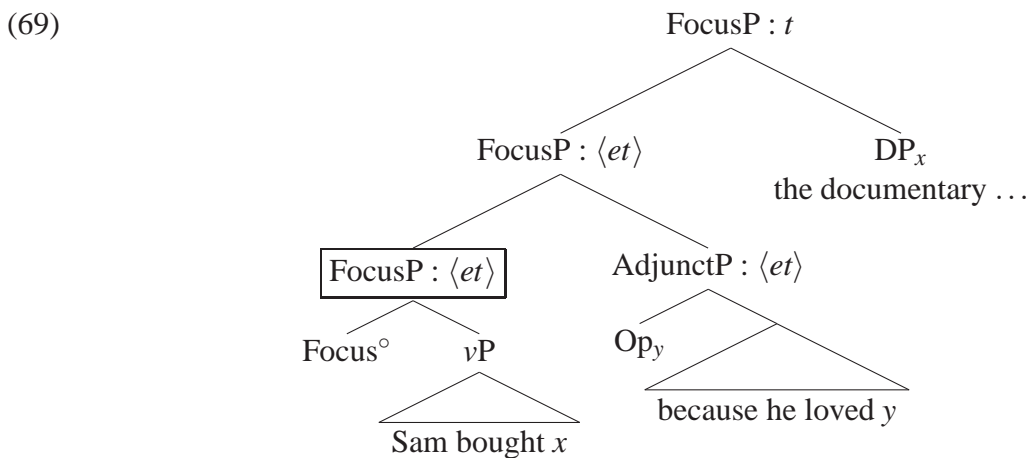
Nissenbaum, like Contreras (1984), Chomsky (1986), and Browning (1987), treats the parasitic gap as the tail of a null-operator chain inside the adjunct clause.[20] The mechanics of this analysis employ the notion of multiple derivational workspaces (for instance, see Chomsky 2000) whereby multiple syntactic objects can be constructed in parallel. In the derivation of (67), there will be a point when the two syntactic objects shown in (68) will have been constructed. The syntactic

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[20]Other analyses for parasitic gaps include Across-the-Board extraction (Ross 1967, Williams 1990, Munn 1992), treating the parasitic gap as a bound null-pronominal (Kayne 1983, Cinque 1990, Frampton 1990, Postal 1993), as well as multidomination (Kasai 2010) and sideward movement (Nunes 2001, 2004).

object on the left is the matrix clause following HNPS of the DP from its verb-adjacent position and the syntactic object on the right is the adjunct clause complete with a null-operator chain. (I have chosen to suppress the event/situation variable for expository purposes.)
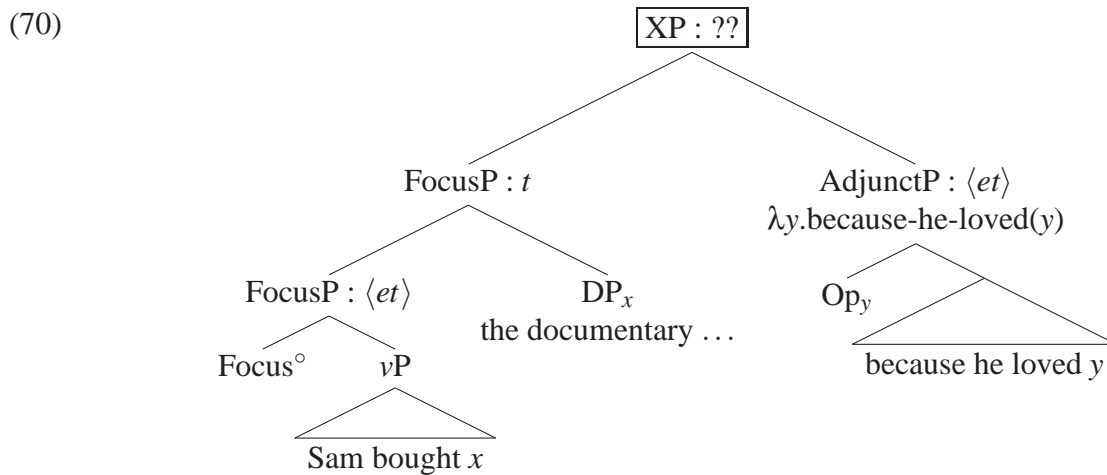
(68)

FocusP : t

FocusP : $\langle et \rangle$

Focus° $\quad$ vP

Sam bought x

DP$_x$
the documentary ...

AdjunctP : $\langle et \rangle$
λy.because-he-loved(y)

Op$_y$

because he loved y

As a null-operator structure, the parasitic gap domain is a type $\langle et \rangle$ abstraction over entities. Because of a type mismatch with the type t FocusP, the adjunct clause cannot be merged cyclically with this node to extend the tree. Nissenbaum (2000:45–46) notes though that HNPS creates a derived predicate in the matrix clause with which the parasitic gap domain could be interpreted via *Predicate Modification* (Heim & Kratzer 1998). Like we saw earlier in (53), the parasitic gap domain must be merged counter-cyclically below the displaced DP with the type $\langle et \rangle$ FocusP node to produce the representation below in (69). Counter-cyclically merging the parasitic gap domain creates an intermediate piece of structure that is another predicate of individuals and which is then able to take the displaced DP as its argument. Thus, for Nissenbaum, HNPS is licensing the presence of a parasitic gap.

(69)

FocusP : t

FocusP : $\langle et \rangle$

DP$_x$
the documentary ...

FocusP : $\langle et \rangle$

AdjunctP : $\langle et \rangle$

Focus° $\quad$ vP

Op$_y$

Sam bought x

because he loved y

While this analysis accounts for many of the properties of parasitic gap constructions (see

29

Culicover 2001 for a discussion of parasitic gaps constructions), I have already argued that it is not straightforwardly compatible with the observations in section 2 and section 4. Recall from section 2 that adjunct clauses that are subject to the Revised Larson's Generalization are adjoined above the locus of HNPS. This captures the observation there and in section 4.1 that the need to bind a parasitic gap licenses rightward movement beyond standard HNPS. Additionally, as argued in section 4.2, the DP moves through any all positions in which it would provide a unique binder for a parasitic gap as opposed to the parasitic gap.

These facts can all be accommodated under Nissenbaum's (2000) representation for parasitic gap structures with only a slight change to its derivation. Instead of forcing the parasitic gap domain to merge counter-cyclically, I suggest that we allow the parasitic gap domain to merge cyclically with the matrix clause. From the two structures that are in (68), we get the partial representation shown in (70).
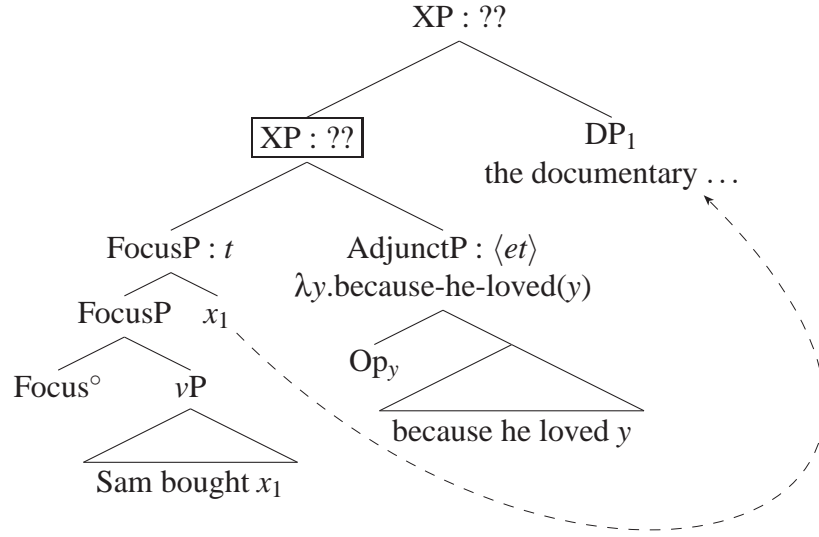
(70)

$$
\begin{array}{c}
\boxed{\text{XP} : ??} \\
\diagup \qquad \diagdown \\
\text{FocusP} : t \qquad\qquad \text{AdjunctP} : \langle et \rangle \\
\diagup \quad \diagdown \qquad\qquad \lambda y.\text{because-he-loved}(y) \\
\text{FocusP} : \langle et \rangle \quad \text{DP}_x \qquad \text{Op}_y \\
\diagup \quad \diagdown \quad \text{the documentary} \ldots \\
\text{Focus}^\circ \quad v\text{P} \qquad\qquad\qquad \text{because he loved } y \\
\qquad\quad \text{Sam bought } x
\end{array}
$$

As indicated, this results in a type mismatch that renders the ⌐XP⌐ node uninterpretable. If we assume that compositionality is a requirement of each step in the derivation, then an operation that could repair the type mismatch at the ⌐XP⌐ node, and effectively provide a binder for the parasitic gap, would be licensed.

I would argue that an additional application of movement that displaces the DP over the adjunct clause could do exactly this. This is precisely what we see below in (71) where the DP *the documentary* ... has undergone an exceptional instance of rightward movement over the clausal

adjunct and has been adjoined to the $\boxed{\text{XP}}$ node.

(71)

$$\text{XP : ??}$$

$\boxed{\text{XP : ??}}$ DP$_1$
the documentary …

FocusP : t AdjunctP : $\langle et \rangle$
$\lambda y.$because-he-loved(y)

FocusP x_1

Op$_y$

Focus$^\circ$ vP

because he loved y

Sam bought x_1

A few words are going to be in order at this point to see exactly how the type mismatch is supposed to be repaired. Notice that the standard treatment of movement (i.e., **Heim & Kratzer** 1998) will not actually help here. The binder index that we expect to be inserted following movement will be inserted immediately below the DP's landing site. The effect of this would be the creation of a derived predicate immediately above the $\boxed{\text{XP}}$ node, but it would do nothing to repair the type mismatch at the $\boxed{\text{XP}}$ node.

To remedy this situation, we can take advantage of the idea that the Merge operation from Chomsky (1995, 2000) can combine syntactic objects in one of the two different ways illustrated in (72) and (73). A syntactic object Y can be merged cyclically with a syntactic object X to extend the tree and form the new object Z (72). Alternatively, Y could be merged counter-cyclically with one of the objects that compose X to create a new syntactic object Z in a way that does not extend the tree. This is illustrated in (73), which resembles the late-merger of relative clauses from Lebeaux 1988 and the counter-cyclic merger of the parasitic gap domain from Nissenbaum 2000.

(72)   *Cyclic Merge*

X   Y $\implies$ Z

A   B   X   **Y**

A   B
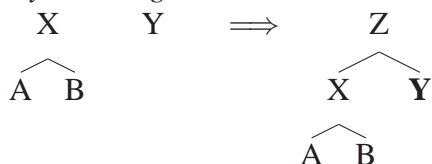
(73)   *Counter-cyclic Merge*

X   Y $\implies$ X

A   B   A   Z

B   **Y**
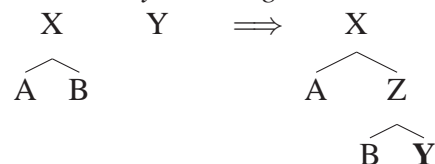
It has also been suggested that Merge is not in itself a single operation, but rather a set of operations that are required to bring two syntactic objects together (Boeckx 2009, Hornstein 2009). Thus, Merge could be seen as a procedure that involves, for instance, the establishment of a sisterhood relation between syntactic objects, the projection of one of these objects, as well as perhaps saturation, theta-role assignment, Agree, etc.

Together, these two previously existing ideas make a third type of Merge procedure conceptually possible in which a subset of the syntactic operations of Merge operate cyclically while another subset of those operations operate counter-cyclically. This scenario is schematized in (74) and I will refer to it as *Mixed Merge*. The operation that establishes a sisterhood relation between two objects operates cyclically by merging Y with X to extend the tree and create the new syntactic object Z. Yet it could be necessary or more beneficial for some other operation(s) necessary for the merger of Y with X to target the object A in a counter-cyclic fashion. Furthermore, one of these counter-cyclically applied syntactic operations could potentially slightly alter A to produce A' in a way that specifically licenses that operation's counter-cyclic application.[21]

(74)   *Mixed-Merge*

    X Y $\Longrightarrow$ Z

    A B   X Y

               A′ B
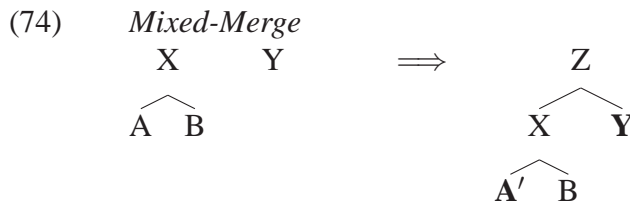
It is this procedure of Mixed Merge that makes the repair of the type mismatch above in (71) possible. Still employing the basics of the treatment of movement proposed in Heim & Kratzer (1998), after the displaced DP is merged cyclically with the $\boxed{\text{XP}}$ node, the syntactic operation responsible for introducing a binder index is applied counter-cyclically below the previously type t FocusP node.[22] In (75) we see that this effectively changes this node into a type $\langle et \rangle$ derived

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[21]It could be argued that there is at least the tacit prediction that Y could form a sisterhood relation with A or B, while some syntactic operation that is a part of Merge operates on the root node X. This is the type of situation that Lechner (2007:37–39) suggests is necessary for counter-cyclic applications of Merge. Applications of Merge that do not extend the tree or alter the label of the root node in a structure should violate the *Extension Condition* (Chomsky 1995). Further research on this procedure and how to properly constrain it will be necessary in future research.

[22]While the presentation of these sub-operations in text demands assigning them some order, I am not committing to the reality of this or any procedural ordering for these sub-operations. It is equally as plausible, I think, that these sub-operations occur in the opposite order or even that they occur simultaneously.

predicate. This in turn allows the previously uninterpretable $\boxed{\text{XP}}$ node to be interpreted as the semantic conjunction of the newly type $\langle et \rangle$ FocusP and the type $\langle et \rangle$ parasitic gap domain. The result is something that exactly parallels the representation for parasitic gap structures licensed by rightward movement that was proposed by Nissenbaum (2000).[23]

(75)
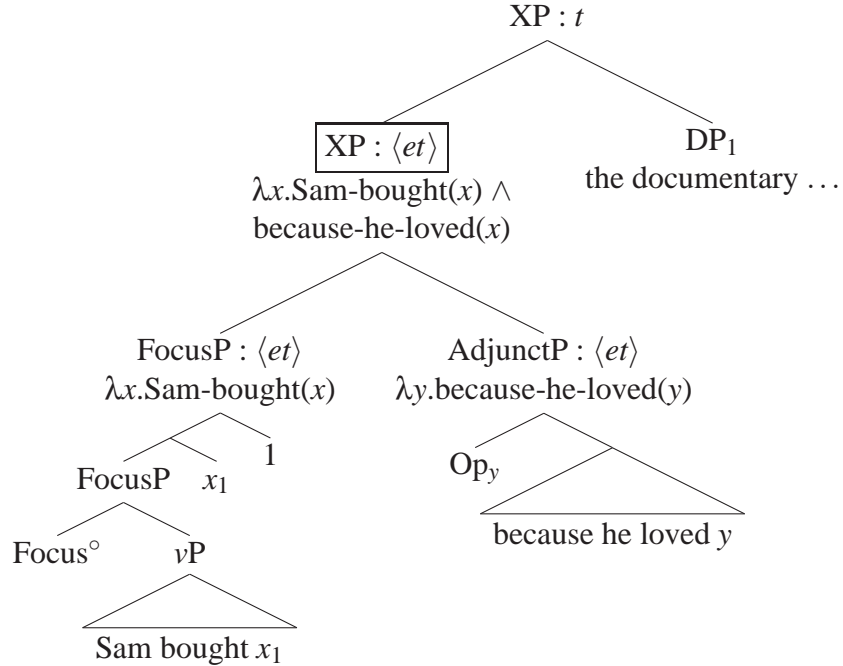
The ultimate effect here is that the movement of the DP is an instance of locally licensed overt type-driven movement. Thus, it is analogous to the independently argued for covert operation of quantifier raising (May 1985, Rooth 1985). In the way that a quantificational DP of type $\langle et, t \rangle$ must undergo an application of movement in order to avoid the problem of a type mismatch with the type $\langle et \rangle$ verb, so will an additional step of movement at the point in the derivation shown in (70) avoid the type mismatch between the type $\langle et \rangle$ adjunct clause and the type t matrix clause. It is the need to repair this type mismatch that licenses what we have seen is exceptional rightward movement.[24] Furthermore, because each parasitic gap domain will face a type mismatch with the

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[23]A non-trivial issue, which also exists for Nissenbaum (2000), is how the structure in (75) is actually being interpreted. In typical cases of clausal adjunction, rationale clauses, temporal adverbial clauses, *because*-clauses, etc. are thought to combine with the matrix clause via a predication operation. Providing a full interpretation for the proposed predicate modification structure would be far outside the scope of this paper as each of the various adjunction structures would require individual attention. It is recognized, however, that further work is needed.

[24]At this point, it can be pointed out that one might wonder whether the initial step of movement to the low FocusP is always necessary or whether a single step of movement licensed solely by the gap could be possible. It came out in personal communication with Anton Ingason that, if the latter were possible, then we should find that rightward

matrix clause, we have a natural way of formalizing the requirement that each parasitic gap is provided a unique binder. The DP must move through a position above each adjunct clause, like in (54b), in order to repair each type mismatch that results from adjoining another parasitic gap domain.

6 Conclusion

The primary goal of this paper was to provide an account for the observation by Larson (1989) that rightward movement, but not leftward movement, past an adjunct clause requires a parasitic gap inside of that adjunct clause. As has been argued, the rightward movement of a DP over certain clausal-adjuncts and beyond standard HNPS is licensed by the need to repair the semantic type mismatch between the matrix clause and the adjunct clause containing a parasitic gap. The reason for the asymmetry between the two types of movement, then, can be attributed to the difference in the licensing conditions for each. Whereas rightward DP movement beyond vP is exceptionally licensed, leftward movement, such as wh-movement, is independently licensed to a position that is higher than the clausal adjuncts that are subject to the Revised Larson's Generalization. Thus, we should expect to find, as we do, that a parasitic gap is optional with wh-movement.

It was also argued in section 4 that rightward movement and the licensing of parasitic gaps is very much like Right Node Raising of DPs according to Sabbagh (2007). Both are in principle unbounded movement operations and may be forced to proceed successive-cyclically by independent principles of the grammar. The emerging picture from these two studies on rightward movement is that they are not in principle different from analogous types of leftward DP-movement. The Revised Larson's Generalization and the unique locality conditions are in fact superficial differences. Assuming the analysis in this paper to be correct, the real difference between leftward and rightward movements does not lie in the actual mechanism that is responsible for movement. Instead, as just noted, the observable differences are the result of how the employment of the movement

movement that is not supported by the discourse context could still be possible in the presence of a parasitic gap. Given what has proceeded in section 4.2.2, this should in principle be possible. However, it is not clear that the facts support this particular idea and further research will be necessary.

mechanism is licensed.

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