# Unbounded Successive-Cyclic Rightward DP-Movement[☆]

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**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 typical 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

## 1. Introduction

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

[☆]This work owes an immense intellectual debt to the research that appears in Nissenbaum 2000. The present article has benefited greatly from discussion with Kyle Johnson, Rajesh Bhatt, and Brian Dillon as well as the many helpful comments and criticisms of the anonymous reviewers for *Lingua*. Additional helpful discussion has come from Klaus Abels, Hamida Demirdache, Tom Ernst, Jeremy Hartman, Gereon Müller, Eric Potsdam, Tom Roeper, Peggy Speas, the participants of the 36th Penn Linguistics Colloquim, the Fall 2010 Syntax Seminar at UMass Amherst, and the Syntax Reading Group at UMass Amherst. Any errors or misrepresentations of the ideas of others are solely my responsibility. Parts of this research were funded by a dissertation improvement grant from the University of Massachusetts Amherst Graduate School.

[1]Throughout this article I will adopt a convention employed in Postal 1994 that sets rightward shifted phrases off from the rest of the clause by means of a dash.

(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 in (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, a parasitic gap is obligatory as shown in (4). Interestingly, as both Engdahl (1983) and Larson (1989) note, the same is not true in the case of leftward displacement like in (5). There is a sense in which the parasitic gap can be considered 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 pattern observed with rightward displacement 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 article is argue for the revised version of this generalization that is found in (7).

(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 an instance of an additional and exceptional application of rightward movement beyond standard HNPS. Section 2 will argue that standard HNPS like in (1) is limited to the edge of *v*P (Bresnan, 1976; Stowell, 1981; Johnson, 1985). For this reason, HNPS is generally unable to cross the particular clausal adjuncts that are adjoined to a position above the edge of *v*P and

are therefore beyond the reach of HNPS. I will further argue, following a claim by Heck and 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 instance of exceptional rightward movement to a position that is otherwise inaccessible.

Section 3 will address the argument by Postal (1994) that all structures like in (2) are derived via Right Node Raising (RNR). I will present experimental evidence supporting the claim that, while known coordinate RNR constructions are subject to an alignment constraint on the position of the shared constituent (the *Right Edge Restriction*; Postal 1974; Wilder 1995; Hartmann 2000; Sabbagh 2007), the types of adjunction structures that are subject to the Revised Larson's Generalization in (7) are not subject to such a constraint. I interpret these results as showing that there are some structures that are subject to the Revised Larson's Generalization but are incompatible with a RNR analysis.

In section 4 we will further investigate this supposedly exceptional rightward movement driven by the need to license a parasitic gap. We will find that rightward DP-movement that results in the binding of a parasitic gap is potentially unbounded in the way that Sabbagh (2007) argues can be true for coordinate RNR constructions and as is generally thought to be the case for more familiar leftward $\overline{\text{A}}$-movements. By examining clausal adjuncts at various heights along the verbal spine, we will observe that rightward DP-movement can be licensed by the need to bind parasitic gaps in adjunct clauses adjoined beyond the edge of *v*P, beyond sentential negation, and even beyond the DP's containing clause (cf. the *Right Roof Constraint*; Ross 1967; Grosu 1973).

Section 5 then presents a formal analysis for the observations represented by the Revised Larson'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 this basic representation for parasitic gap structures and suggest a slight modification for how such structures are derived. Essentially, the cyclic (as opposed to counter-cyclic) merger of the parasitic gap domain produces a structure that cannot be interpreted at LF via standard methods of composition (e.g. Heim and Kratzer, 1998). I suggest that it is the ability of the rightward DP-movement to ensure convergence of the syntactic structure in the LF component that provides the necessary motivation for DP-movement beyond what is possible with standard HNPS.

Section 6 will conclude by summarizing the arguments and discussing some of the implications of the results. To the extent that the analysis presented in this paper is the correct analysis, it provides support for models of grammar that employ transderivational constraints. Such models may allow us to begin to get a

handle on the differences we observe between leftward and rightward movements.

## 2. Revising Larson's Generalization

### *2.1. Low Adjuncts and High Adjuncts*

The requirement for a parasitic 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.[2]

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

b. * Sam bought $e_1$ because he enjoyed the cinematography – [a film about Bengal tigers]$_1$.

(9) a. Tim brought $e_1$ in order to show Pam $pg_1$ – [the pictures from his vacation last summer]$_1$.

b. * Tim brought $e_1$ in order to show Pam the quality of his camera – [the pictures from his vacation last summer]$_1$.

[2]I have encountered two ways in which the examples (4) and (8)–(10) with a DP displaced rightward over an adjunct clause without a parasitic gap can be made more acceptable. The first, which represents the shape of the original examples from Larson (1989), is to put a pronoun in place of the full DP in the adjunct clause. The anonymous reviewers provide the following examples for which I have suppressed any judgments.

(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]$_1$.

Second, the relevant examples can be made more acceptable as a function of the prosody assigned to the adjunct clause. The more phonologically reduced the adjunct phrase is and the larger that the intonational boundaries around the adjunct clause are, the more parenthetical the phrase seems to become.

These are both issues that warrant much more attention than I am able to afford them in this article. However, in section 3, I report on the results of an acceptability judgement study that attempted to control for the ability to treat the adjunct clause as a parenthetical. Following Potts (2002), I examine constructions in which a negative quantifier in the matrix clause binds a variable in the adjunct clause. I also return briefly to the examples in (i) and (ii) in section 5.2 where I speculate on their potential grammaticality. As one anonymous reviewer suggests, we might be observing a resumption strategy in the parasitic gap domain. Alternatively, we might extend the formal analysis presented in that section to permit movement that produces otherwise unavailable binding configurations (e.g. Fox, 2000; Reinhart, 2006; Takahashi, 2006).

(10) a. Kim burned $e_1$ after reading $pg_1$ – [each article on parasitic gaps]$_1$.
b. * Kim burned $e_1$ after reading the abstracts – [each article on parasitic gaps]$_1$.

Of course, the rightward displacement of DPs is not categorically contingent on the presence of a parasitic gap. HNPS is almost defined as the displacement of a DP to the right of some PP or AdvP like in (11)–(14). Let us refer to these examples in which a DP is displaced rightward over a phrasal adverbial as cases of "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]$_1$.

There is an interesting observation we can make concerning the ordering restrictions that exist between the set of phrasal adverbials in (11)–(14) and the set of clausal adjuncts in (2) and (8)–(10) that are subject to Larson's Generalization. Given a member from each of these sets, the phrasal adverbial must precede the clausal adjunct (15)–(18).

(15) 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].

(16) a. Pam closed the window [softly] [in order to let the children sleep].
b. * Pam closed the window [in order to let the children sleep] [softly].

(17) a. Tim wiped the grill [clean] [because he was going to use it].
b. * Tim wiped the grill [because he was going to use it] [clean].

(18) a. Kim gave a photo collage [to her best friend] [by ordering one online].

b. * Kim gave a photo collage [by ordering one online] [to her best friend].

One way to interpret these facts is along the lines suggested by Reinhart (1983) and Ernst (1999) whereby we are seeing a difference in the attachment height of the elements in each set. In particular, the data suggest that clausal adjuncts that are subject to Larson's Generalization are adjoined to a position on the verbal spine that is structurally higher than the position of the phrasal adverbials.

The idea that these two sets of elements are distinguished based on their structural height finds support from the *though*-movement diagnostic in Baltin 1981. In the examples in (19)–(22) below we see that the phrasal adverbials that can be crossed by standard HNPS resist being stranded by the *though*-movement operation. This suggests that they must be part of a constituent that includes the verb and which can be targeted for movement.

(19) 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.

(20) 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.

(21) 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.

(22) a. [Give a photo collage to her best friend]$_1$ though she may $e_1$, Kim is keeping the t-shirts.

b. * [Give a photo collage]$_1$ though she may $e_1$ to her best friend, Kim is keeping the t-shirts.

The clausal adjuncts that are subject to Larson's Generalization, on the other hand, behave differently with respect to this diagnostic. The examples in (23)–(26) show us that these clausal adjuncts do not necessarily need to be part of the constituent targeted for the fronting operation.

(23) a. [Meet his team members before going to practice]$_1$
though he will $e_1$, Sam is still going to get fajitas first.

b. [Meet his team members]$_1$ though he will $e_1$
before going to practice, Sam is still going to get fajitas first.

(24) a. [Close the window in order to let them sleep]$_1$
though she did $e_1$, something still managed to wake the children.

b. [Close the window]$_1$ though she did $e_1$ in order to let them sleep,
something still managed to wake the children.

(25) a. [Wipe the grill clean because he needed to use it]$_1$
though Tim did $e_1$, he still managed to ruin the burgers.

b. [Wipe the grill clean]$_1$ though Tim did $e_1$
because he needed to use it, he still managed to ruin the burgers.

(26) a. [Give a photo collage to her best friend by ordering one online]$_1$
though she may $e_1$, Kim is keeping the t-shirts.

b. [Give a photo collage to her best friend]$_1$ though she may $e_1$
by ordering one online, Kim is keeping the t-shirts.

Collectively these data are consistent with the claim that clausal adjuncts that are subject to Larson's Generalization adjoin to a position on the verbal spine that is higher than the phrasal adverbials are capable of adjoining. If we accept this idea we are able to account for the *though*-movement facts above by asserting that the phrasal adverbials from (11)–(14) are necessarily adjoined below the node that is being targeted by the fronting operation. This is the reason that they cannot be stranded by the fronting operation as shown in (19)–(22). From the examples in (23)–(26), it seems that the clausal adjuncts that are subject to Larson's Generalization are able to adjoin to a position either above or below the node targeted for the fronting operation. However, as the ordering facts in (15)–(18) reveal, even the lowest point of attachment for these clausal adjuncts will be higher than the highest point of attachment of the phrasal adverbials.

### *2.2. Larson's Generalization as a Function of Height*

Distinguishing phrasal adverbials and the relevant set of clausal adjuncts on the basis of their height of attachment will also put us in a position to provide an account for why Larson's Generalization holds. In other words, we can understand why it is that standard HNPS can cross the phrasal adverbials in (11)–(14) but, under normal circumstances, cannot cross the set of clausal adjuncts that are subject to Larson's Generalization. The ability of a rightward moving DP to cross

a given element can be understood as a function of the structural height of that element.

There is previous research on HNPS that has basically settled on the idea that it is a movement operation that targets the edge of the first dominating *v*P-layer (Bresnan, 1976; Stowell, 1981; Johnson, 1985).[3] Following this research I will assume that there is a position at the edge of *v*P that hosts a DP that undergoes HNPS.[4] Let us place the phrasal adverbials from above into a category of Low Adjuncts that have a position on the verbal spine that is necessarily lower than the position targeted by standard HNPS. It is because of the relatively low position of this class of elements that they can be freely crossed by HNPS as illustrated in (27). The clausal adjuncts for which Larson's Generalization holds will be made members of an opposing class of High Adjuncts. They are necessarily adjoined to some XP on the verbal spine that is higher than the locus of HNPS, as shown in (28).[5] It is because of their relatively high position that they are simply unable to be crossed by an instance of standard HNPS.[6]

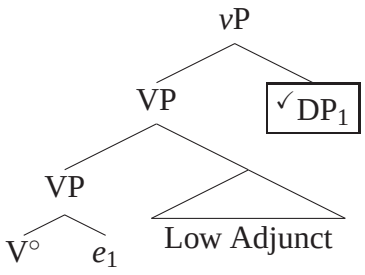
[3]Alternative analyses of HNPS include Larson's (1988; 1989) Light-Predicate Raising analysis and various leftward remnant movement analyses presented in Kayne (1994, 1998), Rochemont and Culicover (1997), Mimura (2009), and Wallenberg (2009, ch. 7). See Takano (2003) for additional evidence that supports such analyses.

[4]I will be more precise about the assumed theory of HNPS section 5.1.

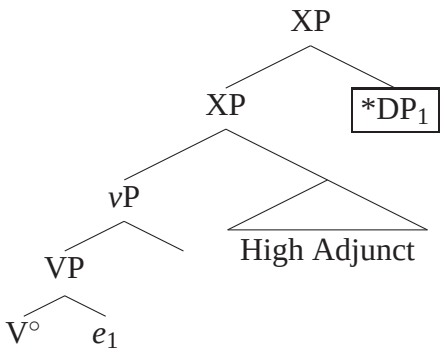
[5]The higher attachment of clausal adjuncts is arguably conceptually intuitive as clausal adjuncts including *because*-clauses, rationale clauses, conditionals, temporal adjunct clauses, etc., seem to describe a relationship between two events/situations or things of a propositional nature. This basic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

[6]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 object 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 (Chomsky, 2001, e.g.,), this is precisely the state of affairs that the discussion presented here has lead us to. HNPS cannot displace a DP beyond the edge of *v*P. We derive the effects of this constraint by setting the necessary locus of standard HNPS as the edge of *v*P.

(27) *HNPS over a Low Adjunct*




(28) *HNPS over a High Adjunct*




This height-based account of the data provides a rather interesting way of thinking about Nissenbaum's (2000) version of Larson's Generalization that was presented in (6). We are finding that an instance of exceptional rightward movement that is to a position that is otherwise inaccessible to standard HNPS 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 (29).

(29) *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 (29) 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 *v*P-internal, and therefore below the locus of HNPS, should not require an additional gap. This prediction is borne out with subject-gap purpose clauses (30), which are commonly thought to be *v*P-internal (Faraci, 1974; Bach, 1982; Huettner, 1989; Jones, 1991), as well as with rationale clauses that modify the embedded clause of a Raising-to-Object predicate (31).[7]

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

(30) 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]$_2$.

(31) 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, the rightward displacement operation's contingency on a parasitic gap is itself contingent on the structural height of the 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 presented here is similar to a proposal by Heck and Müller (2000, 4,9–11). *Wh*-scrambling, which is illustrated in example (32), is a (mostly) banned movement in German. Heck and Müller (2000) show with the example in (33a), though, that *wh*-scrambling can be triggered in multiple *wh*-questions by the need to bind a parasitic gap. The contrast between (33a) and (33b) further illustrates that the scrambling operation is in fact required in the presence of a parasitic gap.

(32) 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

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

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

This exactly mirrors the paradigm that is represented by the Revised Larson's Generalization. In both English and German, the need to provide a binder for a parasitic gap is necessitating DP-movement that is otherwise not possible. For the English data that fall under the Revised Larson's Generalization, I will argue

in what follows that an instance of movement beyond standard HNPS is being licensed by the presence of a parasitic gap.

In section 4 we will look at a number of predictions that such an account makes. We will find that a parasitic gap does in fact license an instance of exceptional movement that targets a position beyond what is possible for standard HNPS. Section 5 will then provide a formal analysis for the empirical generalization 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 RNR

Postal (1994) made an influential claim that structures like those in (34) below, which I have characterized as being subject to the Revised Larson's Generalization, in fact do not contain a parasitic gap. Postal argues instead that all such structures are derived via the same mechanism that is responsible for deriving coordination structures like in (35). For the purpose of this section, I will refer to the types of structures in (34) and (35) with the theory-neutral term *dependent-gap structure* in reference to the fact that at least one gap position is dependent on the presence of another gap position. I will distinguish them here respectively as *adjunct* dependent-gap structures and *coordinate* dependent-gap structures. In order to remain temporarily neutral about the status of the relevant gap position in (34), I will mark it with □.

(34) *Adjunct dependent-gap structure*
Sam bought $e_1$ before Kim stole $\square_1$ –
[an autographed picture of Jonathan Frakes]$_1$.

(35) *Coordinate dependent-gap structure*
Sam bought $e_1$ and 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 (RNR)* since Postal 1974.[8] Postal

[8]RNR has been analyzed as backward deletion/ellipsis (Ross, 1970; Wexler and Culicover, 1980; Hartmann, 2000; Abels, 2004; Bošković, 2004; Ha, 2008), Across-the-Board extraction (Maling, 1972; Bresnan, 1974; Postal, 1974, 1998; Sabbagh, 2007), and multidom-

(1993, fn. 12, 1994, 80) notes that it was generally accepted, following the appearance of Engdahl 1983, that adjunct dependent-gap structures are derived via rightward movement and parasitic gap licensing.[9] This position is challenged directly by Postal (1994, 80,96,111) on the grounds that a number of constraints on the distribution of parasitic gaps induced by leftward movement fail to constrain the presence of □. Noting further that these same constraints also fail to limit the presence of the second gap in coordinate dependent-gap structures, Postal argues that it is RNR instead of parasitic gap licensing that is responsible for all adjunct dependent-gap structures.[10]

This section presents an argument which, if correct, requires us to reject the hypothesis that adjunct dependent-gap structures like (34) and coordinate dependent-gap structures like (35) are categorically derived via a single mechanism, namely RNR. We will see here that a constraint on the derivation of known RNR structures like (35) does not constrain the derivation of adjunct dependent-gap structures in (34).[11] 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 RNR.

### *3.1. A Goal-Extraction Asymmetry*

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

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ination (McCawley, 1982; Blevins, 1990; Phillips, 1996; Wilder, 1999; Johnson, 2007; Bachrach and Katzir, 2009). The exact mechanism (or mechanisms; see Barros and Vicente 2010 and Larson 2012) behind RNR are not of immediate consequence here and so will be set aside.

[9]There are exceptions including attempts by Pesetsky (1982); Huybregts and 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]As Postal (1994, fn. 32) notes, it does not follow from this argumentation that a parasitic gap *cannot* appear in an adjunction structure. We are licensed to conclude only that □ does not have to be a parasitic gap. Therefore, Postal's conclusion rests on the implicit premise that only a single mechanism may target any given dependent-gap structure. To my knowledge, this has not been demonstrated and, therefore, the alternative hypothesis that adjunct dependent-gap structures can be derived by either RNR or parasitic gap licensing is still valid.

[11]Overfelt (accepted) presents additional evidence from derived-island effects and relational adjectives to illustrate that adjunct dependent-gap structures and coordinate dependent-gap structures show differing behaviors with respect to properties of RNR.

(36) *Right Edge Restriction*
In the configuration:
$[[_A \ldots X \ldots ]$ Conj. $[_B \ldots X \ldots ]]$
$X$ must be rightmost within $A$ and $B$ before $X$ can undergo RNR.
(adapted from Sabbagh, 2007, 355)

The following examples in (37) 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 (37a) with the PP frame, but cannot be satisfied in (37b) with the double-object frame, which ultimately results in ungrammaticality.

(37) 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 (38), then, are interesting as the contrast between the two ditransitive frames is drastically reduced if not entirely lost when we replace the coordination structure with an adjunction structure.

(38) a. Tim met $e_1$ in order to give a present to $\square_1$ –
[his best friend from college]$_1$.
b. Tim met $e_1$ in order to give $\square_1$ a present –
[his best friend from college]$_1$.

Of particular interest to the argument being made here is the contrast between (37b) and (38b). It is not the case in either string that the gaps are rightmost in their respective domains as required by the Right Edge Restriction. Yet, (38b) is more acceptable than (37b). The examples below in (39) and (40) are intended to help establish the generality of this pattern. The same contrast in acceptability arises between a coordinate dependent-gap structure in the (a.) variants and an adjunct dependent-gap structure in the (b.) variants when the relevant gap is part of the double-object frame.

(39) 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 $\square_1$ his secret laboratory –
[the members of the incoming class of graduate students]$_1$.

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

b. Kim surprised $e_1$ by offering $\square_1$ a raise – [everyone who showed up early].

This contrast between these structures in this environment can be interpreted as showing that the coordinate dependent-gap structures are subject to the Right Edge Restriction but adjunct dependent-gap structures are not.[12] 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, seeing as adjunct dependent-gap structures are not subject to this known constraint on RNR, some alternative analysis for them seems to be required. Because this argument relies on a contrast between contrasts and because we are dealing with intuitions about fairly complex structures, the following section reports on an experiment designed to test the hypothesis and intuitions reported here.

### *3.2. Experimental Evidence*

An acceptability judgement study was designed to test the hypothesis that coordinate dependent-gap structures are derived via RNR and adjunct dependent-gap structures may be derived via some alternative mechanism. If this is so, we predict in the same way as above that coordinate dependent-gap structures, but not adjunct dependent-gap structures, are sensitive to the Right Edge Restriction. The empirical predictions follow the same logic that we saw in the previous subsection. We expect to find that a dependent gap in the double-object frame, but not in the PP frame, will result in a greater decrease in acceptability given a coordination structure than it will given an adjunction structure as in (37) and (38). As we will see below, this experiment was also designed to ensure that this pattern, if observed, could be attributed to the creation of a dependent-gap site. If there is

[12] Wilder (1997, 1999); Sabbagh (2007), and Kluck and de Vries (2013) have noted that rightward displacement 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 (38b) is feeding an application of RNR. 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 RNR analysis for adjunction structures (38b) and is precisely what blocks the application of RNR in coordination structures (37b).

no rightward displacement, we should expect to observe that the contrast between ditransitive frames in coordination and adjunct structures is neutralized.

### *3.2.1. Participants*

Sixty-four native speakers of English were recruited for the study using Amazon Mechanical Turk, a web-based service for crowd-sourcing tasks.[13] Only participants with a minimum 95% success-rate on a minimum of 100 tasks were accepted for participation. To prevent evaluating data from non-native speakers, participation was restricted to IP addresses in the United States and participants were asked to report their language abilities. Three participants reported a native language other than English. The data from these participants were removed and replaced. Another participant's data was replaced on suspicion of not properly attending to the task. Participants ranged in age from 18 to 73 with an average age of 36.0 years and a median age of 32.0 years. Of the 64 participants, 42% were female and 58% were male.

### *3.2.2. Materials*

The materials consisted of 16 items distributed across 8 lists in a fully crossed $2\times2\times2$ design that included the factors *Structure*, *Frame*, and *Situ*. A full example item is provided in (41) and a full list of the experimental items can be found in Appendix A. The factor Structure refers to whether the item had an adjunct dependent-gap structure (41a) or a coordinate dependent-gap structure (41c). Items differing on the dimension of Frame had the dependent-gap position presented in either the Double-Object (DO) frame (41a) or the Prepositional Phrase (PP) frame (41b). Finally, the factor Situ provided a set of controls that presented the shared DP either Ex-situ (41a) or In-situ (41e).

(41) a. *Adjunction / Double-Object / Ex-situ*
No judge should contact, in order to give his scoresheet,
the contestants in this month's competition.

b. *Adjunction / Prepositional Phrase / Ex-situ*
No judge should contact, in order to give his scoresheet to,
the contestants in this month's competition.

c. *Coordination / Double-Object / Ex-situ*
No judge should contact, and give his scoresheet,
the contestants in this month's competition.

[13] Amazon Mechanical Turk can be accessed at: https://www.mturk.com

d. *Coordination / Prepositional Phrase / Ex-situ*
No judge should contact, and give his scoresheet to,
the contestants in this month's competition.

e. *Adjunction / Double-Object / In-situ*
No judge should contact the contestants in this month's competition,
in order to give his scoresheet.

f. *Adjunction / Prepositional Phrase / In-situ*
No judge should contact the contestants in this month's competition,
in order to give his scoresheet to.

g. *Coordination / Double-Object / In-situ*
No judge should contact the contestants in this month's competition,
and give his scoresheet.

h. *Coordination / Prepositional Phrase / In-situ*
No judge should contact the contestants in this month's competition,
and give his scoresheet to.

All experimental items included commas setting off the second conjunct or adjunct phrase in exactly the way shown in (41). This was intended to relieve on-line processing difficulty and to help participants assign the intended prosody.

A concern with this experimental design, which was mentioned briefly in footnote 2, was that it does not guarantee for the DO conditions in particular that participants would not interpret the adjunct clause or the second conjunct as a parenthetical with an implicit Goal/Recipient argument. This strategy would effectively provide a means for bypassing any requirement to assign a dependent-gap interpretation to these structures (viz., the Revised Larson's Generalization and Ross's (1967) *Coordinate Structure Constraint*) and complicate the interpretation of the results.[14] Several steps were taken to discourage participants from this analysis.

First, the ditransitive verb was always either *give* or *tell*, which were distributed equally among the 16 items. These verbs were chosen for their general relative dispreference for appearing with an implicit Goal/Recipient as well as their strong bias toward appearing in the DO frame. According to the corpus database of ditransitive constructions compiled by Bresnan et al. (2007), *give* appears in the DO frame in %84.6 of its 1,666 occurrences and *tell* appears in the DO frame in %95.3 of its 128 occurrences. These properties were intended to en-

[14] See Dubinsky (2007) for argumentation that parasitic gaps are not licensed in parenthetical material by $\overline{\text{A}}$-movement in the matrix clause.

courage participants to incorporate a displaced DP into the potential gap position and, thus, posit a dependent-gap when possible.[15]

The second step was an attempt to block the possibility of treating the adjunct clauses and second conjuncts as a parenthetical. To do this, the theme argument in the adjunct clause or second conjunct always contained a variable that was intended to be bound by a quantificational matrix subject (e.g., *No judge … his scoresheet* in (41)). The example in (42), which has been adapted from Potts (2002, 664), demonstrates that variable-binding into a parenthetical is not possible.

(42) * No hiker$_1$ was, as she$_1$ admitted,
prepared for the freezing temperatures.

Additionally, a negative quantifier was always used in the experimental items given their general inability for telescoping.

Finally, the In-situ conditions were added to act as controls for the Ex-situ conditions. Presumably, participants would not posit a dependent-gap in the adjunct clause or second conjunct of these structures seeing as this is disallowed by the grammar. In as far as the In-situ conditions are acceptable, participants would be required to posit an implicit Goal/Recipient. Therefore, In-situ conditions will reveal the acceptability patterns that we should observe in the case that participants are not constructing dependent-gap structures in the Ex-situ conditions. It is from this that we get the prediction that, if the relevant interaction between Structure and Frame emerges, we should find it only in the Ex-situ conditions.

### *3.2.3. Procedure*

After providing informed consent, participants clicked on a link that took them to the on-line experiment presentation tool Ibex Farm where the experimental items were presented.[16] Participants were told that they would be reading sentences and evaluating their acceptability as sentences of English. They then received a short guided practice for using a 7-point Likert-scale where 1 corre-

[15] Within an eye-tracking paradigm Staub et al. (2006) demonstrate for standard HNPS that participants form an expectation for a DP downstream when a verb with a strong transitivity bias appears in its intransitive frame. Their conclusion, which I am attempting to capitalize on here, is that a strong transitivity bias on a verb will lead participants to posit the gap of a rightward displacement operation relatively early in their parse of the string.

[16] Ibex Farm was developed by Alex Drummond and can be accessed at: http://spellout.net/ibexfarm/.

sponded to “Completely Unacceptable” and 7 corresponded to “Completely Acceptable”.

The items were presented in a Latin-square design and were randomly distributed among 38 filler items. The filler items had a large proportion of sentences with a non-canonical word order including passive and cleft constructions. A total of 6 items were designed to be ungrammatical by including an island violation, a case assignment problem, a violation of a selectional restriction, or having non-English word-order. The Likert-scale with the corresponding scale values were presented along with each item, which was always presented on a single line. The experiment took an average of approximately 14 minutes to complete and participants received $0.50 in compensation upon completing the task.

*3.2.4. Results*

The mean naturalness rating for each condition is presented graphically in Figure 1 and numerically in Table 1.

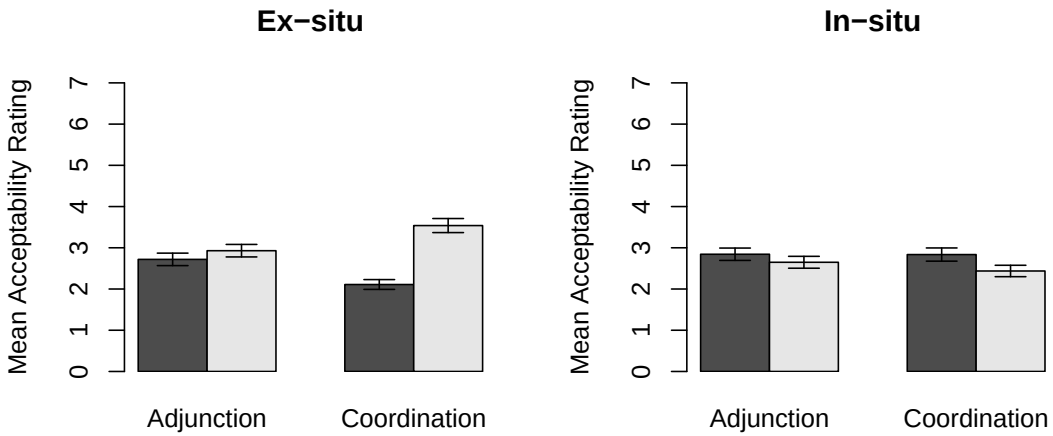



Figure 1: Mean acceptability ratings by condition with standard error bars

| | Ex-situ | | In-situ | |
|---|---|---|---|---|
| | Adjunction | Coordination | Adjunction | Coordination |
| DO | 2.72 (0.16) | 2.11 (0.13) | 2.84 (0.15) | 2.84 (0.15) |
| PP | 2.93 (0.16) | 3.54 (0.16) | 2.65 (0.13) | 2.44 (0.14) |

Table 1: Mean acceptability ratings by condition with standard errors in parentheses.

The data were analyzed using a linear mixed-effects (LME) regression model (Baayen et al., 2008) with the `lme4` package (Bates et al., 2014) in the statistical computing environment R, version 3.1.1 (R Core Team, 2014). The fixed effects of Structure, Frame, and Situ, as well as their interactions, were included as predictors and centered around 0 (Adjunction/DO/Ex-situ = 1). Both subjects and items as well as the predictors and their interactions were assigned random slopes. The model that was evaluated is provided in (43).

(43) $$\begin{aligned}\text{Rating} \sim \text{Structure} \times \text{Frame} \times \text{Situ} + \\ (\text{Structure} \times \text{Frame} \times \text{Situ} + 1|\text{subject}) + \\ (\text{Structure} \times \text{Frame} \times \text{Situ} + 1|\text{item})\end{aligned}$$

This model yielded the results summarized in Table 2. Significance at the traditional $\alpha = 0.05$ level was determined by an absolute $t$-value greater than 2.00. With this criterion a significant main effect was revealed for the fixed effect Frame and significant interactions were observed for Structure×Frame and Frame×Situ. Importantly, there was a significant effect of the three-way interaction term Structure×Frame×Situ. From the pattern of the means shown in Figure 1, we see that the three-way interaction reflects a large effect of the choice of ditransitive Frame for Coordination/Ex-situ structures, compared to the small or non-existent effect of Frame for all other conditions.

| | $\hat{\beta}$ | Std. Error | $t$ |
|---|---|---|---|
| (Intercept) | 2.758 | 0.135 | 20.474 |
| Structure | 0.027 | 0.041 | 0.665 |
| Frame | -0.131 | 0.048 | **-2.736** |
| Situ | 0.066 | 0.081 | 0.824 |
| Structure×Frame | 0.127 | 0.049 | **2.610** |
| Structure×Situ | -0.027 | 0.060 | -0.459 |
| Frame×Situ | -0.279 | 0.050 | **-5.638** |
| Structure×Frame×Situ | 0.178 | 0.056 | **3.156** |

Table 2: LME model results with estimate, standard error, and $t$-value.

*3.2.5. Discussion*

It is the Structure×Frame×Situ interaction, that we are particularly interested in. I interpret the observation that the choice of ditransitive frame effects ac-

ceptability only in coordinate dependent-gap structures with a displaced DP to mean that it is only coordinate dependent-gap structures that are subject to the Right Edge Restriction. The absence of an effect of the choice of ditransitive frame in adjunct dependent-gap structures in turn suggests that these structures are *not* subject to the Right Edge Restriction. This strongly suggests that adjunct dependent-gap structures can be derived via a mechanism distinct from RNR.[17]

With this being said, there is a complication in the data that is worth addressing. Recall that there was a concern that participants might treat the intended DO dependent-gap structures as parentheticals with an implicit Goal/Recipient argument. Looking again at the observed condition means one might object to the interpretation of the results that have been endorsed above on contention that the Adjunction/DO/Ex-situ condition are so similar to the Adjunction/DO/In-situ condition. One might contend specifically that the Adjunction/DO/Ex-situ mean is inflated as a result of participants positing an implicit Goal/Recipient argument, which they also managed to do for the DO/In-situ conditions.

There are at least two reasons to think that this was not the case. First, there is no principled reason why this alternative strategy would have been available to inflate the Adjunction/DO/Ex-situ mean, but participants then failed to employ it specifically in Coordination/DO/Ex-situ conditions. Second, if such a strategy were available, we would expect to find a significant positive linear relationship between items in their Adjunction/Ex-situ and Adjunction/In-situ conditions with respect to their acceptability of containing an implicit argument. That is, an item that more readily permits an implicit argument analysis should do so in both Ex-situ and In-situ conditions and, thus, it should be possible to predict one from the other. A post-hoc examination of the data investigated this expectation.

[17] An anonymous reviewer points out that one might be tempted to conclude that, regardless of the results, the experimental items are nonetheless ungrammatical given their remarkably low ratings. To assuage such concerns I would note first that no a priori predictions were made regarding the magnitude of the acceptability rating judgment for any of the conditions because these values will necessarily be an artefact of the experimental design and the particular fillers that were used. Thus, as the anonymous reviewer notes, it is entirely plausible that we are observing a ceiling effect. There is very good reason to think that is precisely the case. Recall that the experimental items that the participants were asked to judge involve a relatively rare and complex construction and were presented without supporting context to motivate the non-canonical word order. Moreover, these constructions require participants to locate and posit multiple gap positions for which there is only indirect evidence (Staub et al., 2006). Finally, unlike the examples presented in (37)–(40), the experimental items also contained an intended quantifier-variable binding relationship that is headed by a negative quantifier.

The acceptability metric was quantified by calculating for each item the difference between the estimated mean of the the DO and PP conditions in the Adjunction/Ex-situ conditions ((41a)-(41b)) and the Adjunction/In-situ conditions ((41e)-(41f)). Fitting a linear model to predict the Ex-situ conditions from the In-situ conditions produced a non-significant linear function in which only 11% of the variation in the Ex-situ conditions is explained by the In-situ conditions ($r^2 = 0.11,\ \hat{\beta} = -0.25,\ \%95\text{CI}\ [-0.65, 0.16],\ t = -1.32,\ p < 0.25$). This provides no evidence for claiming that the acceptability ratings of the Adjunction/DO/Ex-situ and the Adjunction/DO/In-situ conditions are correlated and, thus, no evidence that same strategy was employed in each case.

To summarize the discussion and the subsection, the evidence presented here supports the argument made above that RNR is not the only mechanism responsible for deriving adjunct dependent-gap structures. The acceptability judgement study provided evidence that coordinate dependent-gap structures are subject to the Right Edge Restriction while adjunct dependent-gap constructions are not. This constitutes strong evidence that some alternative mechanism must also be available for licensing a dependent-gap in an adjunct clause. Following Engdahl (1983) et seq., and based on the argumentation to follow, I will continue to treat this alternative mechanism as rightward DP-movement and the licensing of a parasitic gap.

## 4. Potentially Unbounded Rightward DP-Movement

I suggested above, following a proposal by Heck and Müller (2000) about *wh*-scrambling in German, that the need to provide a binder for a parasitic gap licenses additional rightward movement beyond just the standard HNPS operation to Spec,*v*P. In this section, I provide further evidence that this additional rightward movement, given common conceptions, is in fact exceptional. Perhaps the most well-known difference between leftward and rightward movement is that rightward movement is subject to much stricter locality conditions than leftward movement (e.g., Ross, 1967; Baltin, 1978, 1981). 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.

We can start with the observation by Lakoff (1970) that the scope of a *because*-clause is ambiguous with respect to negation (44).

(44) Sam didn't leave because he was tired.

a. CAUSE $>$ $\neg$
"Because Sam was tired, it's not the case that he left."

b. $\neg$ $>$ CAUSE
"It's not the case that, because Sam was tired, he left."

Relevant for the point being made here is that a parasitic gap in a *because*-clause interpreted above negation can license movement of a DP as shown in (45a). This example has been designed to be biased towards the wide-scope interpretation of the *because*-clause and to block a RNR derivation with a double-object construction (see section 3). Furthermore, we can note that the parasitic gap is necessary to license the movement (45b).

(45) a. Tim didn't invite $e_1$ because he would have to give $pg_1$ a gift –
[the guy who throws such extravagant parties]$_1$.
"Because Tim would have to give him a gift, he didn't invite the guy who throws such extravagant parties."

b. * Tim didn't invite $e_1$
because he would have to give everyone a gift –
[the guy who throws such extravagant parties]$_1$.
"Because Tim would have to give everyone a gift, he didn't invite the guy who throws such extravagant parties."

This example suggests that the movement of the DP that results in the binding of a parasitic is able to target a position that is not only beyond the edge of *v*P as argued in section 2.2, 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* in a DP that has undergone standard HNPS remains licensed by sentential negation (46). This is consistent with our conclusions above that standard HNPS targets the first dominating *v*P.

(46) a. Tim doesn't invite any of his superiors in the department to parties.

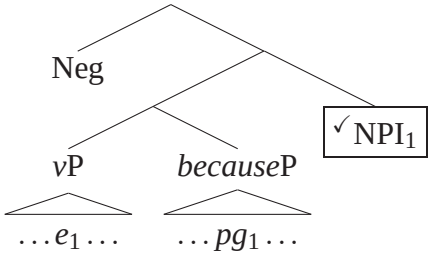
b. Tim doesn't invite $e_1$ to parties – [any of his superiors in the department]$_1$.

Let us simply assume for the moment that the movement licensed by a parasitic gap targets a position immediately above the clause containing a parasitic gap.[18] If

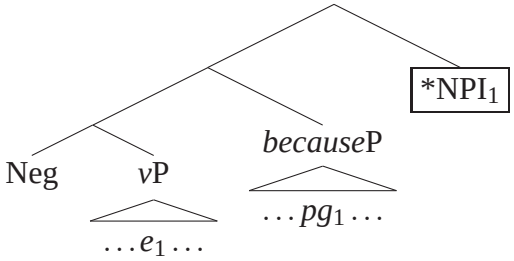
[18] What follows will support this assumption. Basically, I am assuming the representation for

we assume further that the ambiguity of a *because*-clause with respect to sentential negation is represented structurally, then it should be possible to predict when an NPI will be licensed following movement that is driven by a parasitic gap.[19] If the *because*-clause takes scope below sentential negation (47), *any* should in principle be licensed in the derived position above the adjunct clause.[20] On the other hand, if the *because*-clause takes scope above sentential negation (48), *any* should fail to be licensed following the displacement operation as its derived position will be outside the scope of negation.

(47) *Low* because-*clause*




(48) *High* because-*clause*




parasitic gaps configurations proposed in Nissenbaum 2000, ch. 2, which will be discussed in more detail in section 5.2.

[19] Also relevant to the discussion here is the observation by Mayr and 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 to be built in section 5. 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 diagnostic that is presented.

[20] 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 (49a), which is based on examples in Partee 1993, are predicted by allowing the negative polarity item to be licensed by covertly raising to a position between negation and the *because*-clause and, thus, avoiding a violation of the Immediate Scope Constraint. Note that this is exactly the configuration achieved by the rightward displacement operation illustrated in (47). The key to the acceptability of these examples, as (49a) shows, is that these constructions require a partitive/specific interpretation of the shifted quantificational DP (e.g. Enç, 1991; Diesing, 1992).

These predictions are borne out in (49) and (50) 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 (49) contains a *because*-clause biased towards scoping below negation. With this interpretation, the rightward displaced NPI remains licensed in (49b). This suggests that its derived position is below negation just as diagrammed in (47). The more interesting case for our purpose is in (50). Here, like in (45) above, the *because*-clause is biased towards taking scope above negation. Rightward displacement of the DP with this interpretation of the *because*-clause, though, is now no longer acceptable (50b). This is expected if this sentence necessarily has the structural configuration in (48) where the NPI has moved above the *because*-clause and, therefore, outside of the scope of sentential negation.

(49) *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.
$\neg\exists x[\text{superior}(x) \wedge \text{CAUSE}(\text{invite}(x,\text{Tim}), \text{want-to-give-them-a-present}(\text{Tim}))]$
"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 –
$[\text{any of the superiors in his department}]_1$.

(50) *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.
$\text{CAUSE}(\neg\exists x[\text{superior}(x) \wedge \text{invite}(x,\text{Tim})], \text{have-to-give-them-a-present}(\text{Tim}))$
"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 –
$[\text{any of the superiors in his department}]_1$.

These examples serve to illustrate that a rightward displaced DP can in fact target a position beyond the edge of *v*P. They also make the interesting point, to which we will return shortly, that the position of the clausal adjunct seems to determine the position targeted by the exceptional movement of the DP.

The next example in (51) is adapted from Nissenbaum 2000, 89. Here we see a rationale clause modifying the matrix predicate *claim* while 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.

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

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

Examples like this suggest that, contra what appears in Ross 1967, rightward movement is not necessarily clause-bounded. The structurally similar example in (52) shows that the same pattern emerges when a RNR derivation is controlled for with the double-object construction.

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

b. * Sam thinks $[_{CP}$ that you like $e_1]$
because he saw you give 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 is targeting positions beyond the immediate *v*P that contains the base-position of the relevant DP and even positions external to that DP's original containing clause. This naturally suggests that a DP could be rightward moved a theoretically unbounded distance from its base-generated position. Doing so, though, requires that the movement is appropriately licensed, which I have suggested can be achieved by the need to bind a parasitic gap.

## 5. Licensing Rightward DP-Movement

This section presents a formal account of the Revised Larson's Generalization, repeated in (53), as well as the results of the previous section.

(53) *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.

Subsection 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 the Revised Larson's Generalization. Subsection 5.2 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 exceptional movement of the DP ensuring compositionality between the matrix clause and the parasitic gap domain. In subsection 5.3 we will turn to the observation by Nissenbaum (2000) that constructions with multiple clausal adjuncts adjoined to the verbal spine require a parasitic gap in each clausal adjunct that is crossed by rightward movement. I argue that observation should be interpreted as evidence that the rightward movement. Subsection 5.4 addresses the seemingly contradictory results of this section and section 4.

### *5.1. When Heavy-NP Shift Is Unlicensed*

In order to formalize the basic analysis outlined in section 2.2, we will start by treating standard instances of HNPS like in (54) as an operation involving rightward movement of the DP (Ross, 1967, 56).

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

Rochemont and Culicover (1990), building on Rochemont (1986), argue that a DP that has been targeted for HNPS receives a focus interpretation.[21] The following question-answer pairs are adapted from Rochemont and Culicover (1990, 24) where they are presented as evidence for this claim.

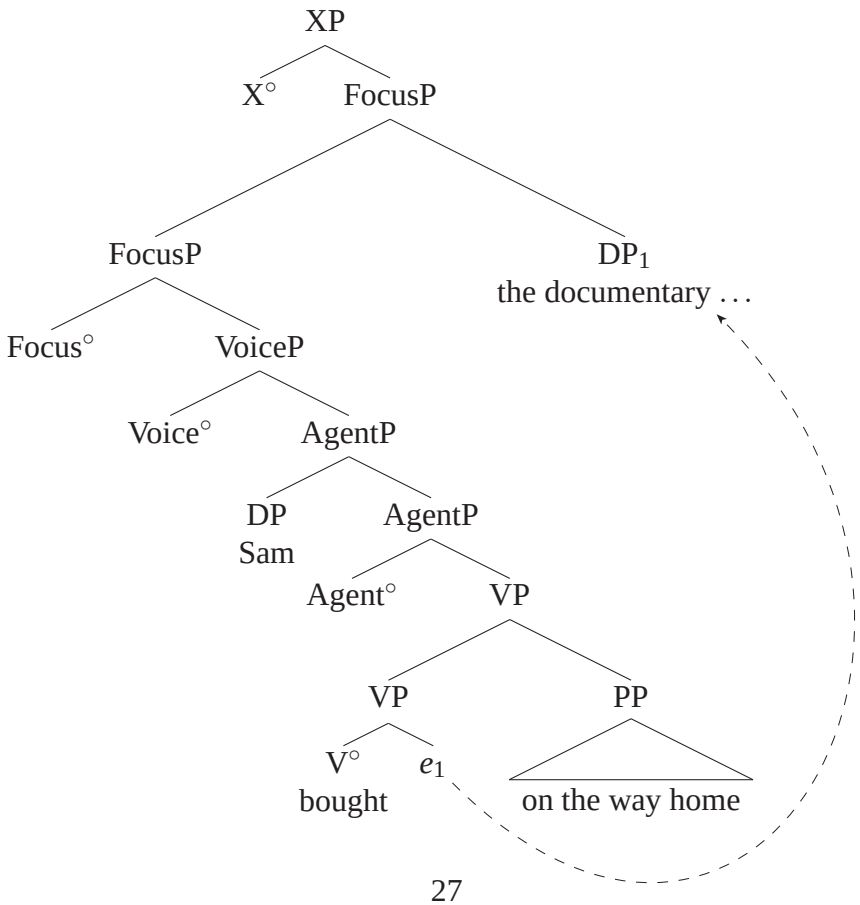
(55) a. Q: What did John purchase for his wife?
A: John purchased for his wife – a brand new fur coat.
b. Q: For whom did John purchase a brand new fur coat?
A: # John purchased for his wife – a brand new fur coat.

[21] It is important to acknowledge that research by Arnold et al. (2000); Wasow and Arnold (2003) and others has demonstrated that structural complexity can motivate rightward displacement independent from the discourse status of the displaced element. This supports the claim by Saito and 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 section 4 and the observation that this movement can have information-structural effects, at least some cases of rightward displacement must take place in the syntactic component.

We see from these examples that a HNPS configuration provides a felicitous answer to the question in (55a) but not to the question in (55b). 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, then, that the relevant information for a *wh*-question can appear in this position (55a). On the other hand, as part of the questioned material in (55b), *a brand new fur coat* is in the conversational background. It, therefore, cannot play the role of focused material and is incompatible with the information-structural requirements on this peripheral position.

Assuming that this interpretation of the observations in (55) are 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 (54), then, will have the partial representation in (56).

(56)



The standard treatment for such instances of movement would propose that it is driven by the need for the DP to check a feature on Focus° (Chomsky, 1995, 2001).[22] For concreteness I will assume the same here and that the checking of this feature is the licensing trigger for HNPS.

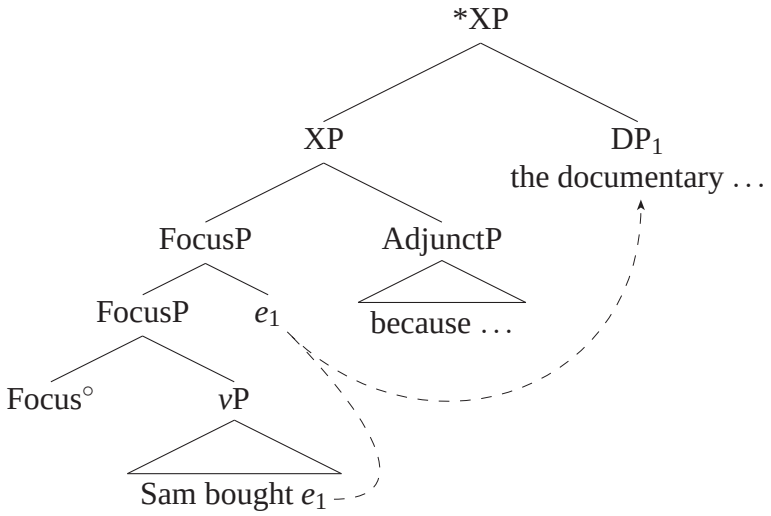
The node XP in the structure above represents some additional extended verbal projection (see Grimshaw, 1991, 1993). This position necessarily dominates the low FocusP that hosts standard HNPS and, for us, represents the lowest available point of attachment for a clausal adjunct that is subject to the 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 a 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 (57a) and its simplified partial representation in (57b) to see this. Much like we saw in the diagram in (28) in section 2.2, movement of the direct object that is purely for the purpose of focus is licensed as far as Spec,FocusP. An operation of movement that takes the DP any further, including over this particular clausal adjunct, is unlicensed.

[22] 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 (2009).

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

b.




Let us take this opportunity, then, to formalize the evaluation metric that determines the movement to Spec,XP in (57) to be unlicensed movement. We will be assuming with Bresnan (1971), Uriagereka (1999), Chomsky (2000), and Epstein and Seely (2002) that derivations proceed cyclically via multiple spell-outs of the syntactic object under construction. The application of an instance of movement in a given spell-out domain will be subject to the following economy constraint in (58), which I have adapted from Chomsky 1992 cited in Reinhart 2006.

(58) *Economy of Movement Metric (EMM)*
If a derivation $D_1$ of a spell-out domain $\alpha$ converges without some movement operation, then $D_1$ blocks a derivation $D_2$ of $\alpha$ that includes that movement operation.

For the types of cases we have been examining, the EMM says that, if the derivation of a spell-out domain containing a clausal adjunct converges without an application of rightward movement (i.e., a parasitic gap would not go unbound), then rightward movement is disallowed in the derivation of that spell-out domain.[23] If XP in (57) is treated as a spell-out domain, the derivation of XP will converge

[23] I will return to what it means for a derivation to converge at the end of section 5.2. The intuitive idea is that a derivation converges if the result is interpretable at the interfaces.

without the additional rightward movement beyond HNPS. This is so given the absence of a parasitic gap in the *because*P. Thus, movement over the clausal adjunct to Spec,XP is blocked.

### *5.2. When Rightward DP-Movement Ensures Compositionality*

We 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 ability to ensure convergence of the spell-domain that contains the clausal adjunct with a parasitic gap that is satisfying the EMM and licensing exceptional rightward movement. More specifically, movement of the DP will ensure composition of the parasitic gap domain with the matrix clause.

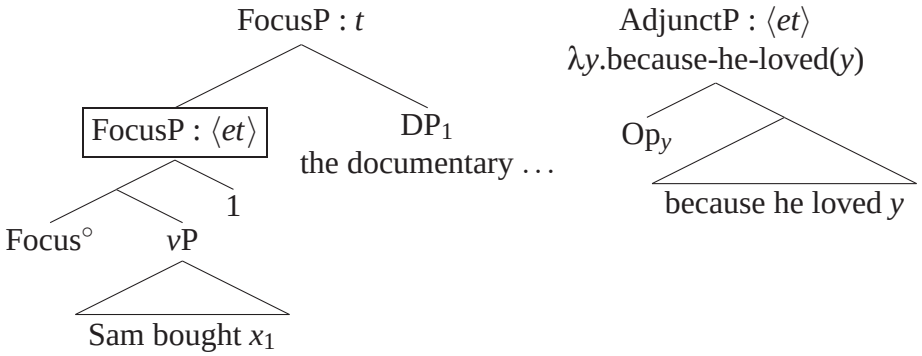
I will be adapting the analysis that was proposed by Nissenbaum (2000, ch. 2) for parasitic gap licensing in examples like (59).

(59) 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.[24] 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 (59), there will be a point when the two syntactic objects shown in (60) will have been constructed. The syntactic 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.)

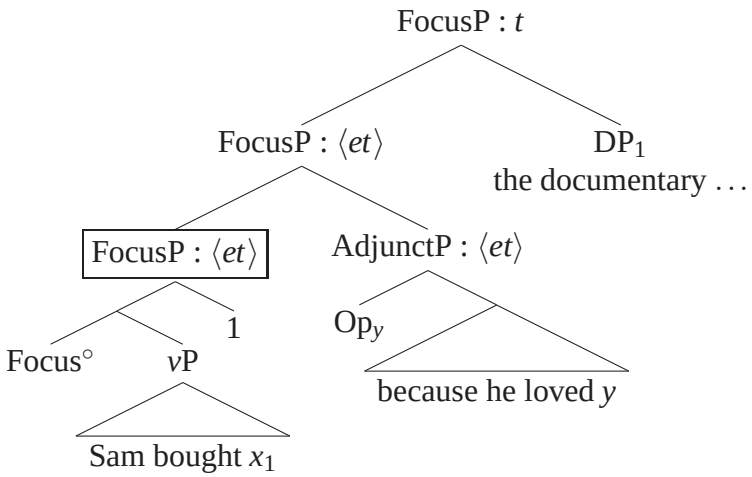
[24] Other analyses for parasitic gaps include Across-the-Board extraction (Ross, 1967; Williams, 1990; Munn, 1992), treating the parasitic gap as a bound null-pronominal (Kayne, 1983; Cinque, 1990; Frampton, 1990; Postal, 1993), as well as multidomination (Kasai, 2010) and sideward movement (Nunes,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

(60)




As a null-operator structure, the parasitic gap domain will be interpreted as a type $\langle et \rangle$ abstraction over entities. Merging this AdjunctP with the type $t$ FocusP will ultimately present the standard methods of composition (Heim and Kratzer, 1998) with a type mismatch. The insight from Nissenbaum (2000, 45–46) is that the HNPS operation effectively licenses the parasitic gap by creating a derived predicate in the matrix clause with which the parasitic gap domain could be interpreted via *Predicate Modification* (Heim and Kratzer, 1998). To capitalize on this observation, Nissenbaum suggests that the parasitic gap domain in fact must be merged counter-cyclically below the displaced DP with the type $\langle et \rangle$ $\boxed{\text{FocusP}}$. The result is the representation below in (61). Counter-cyclically merging the parasitic gap domain creates an intermediate piece of structure that is interpreted as another predicate of individuals which takes the displaced DP as its argument.

(61)

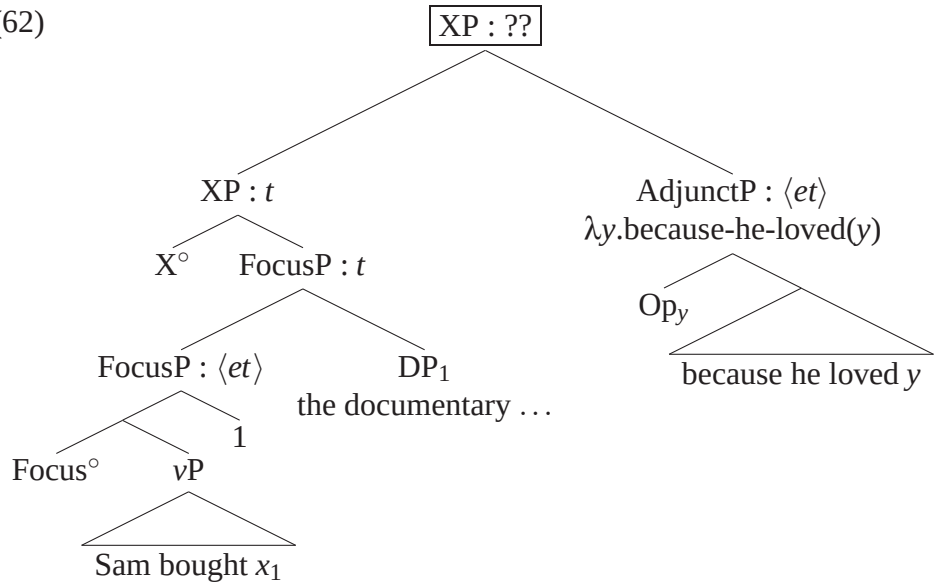



While this analysis accounts for many of the properties of parasitic gap con-

structions,[25] it is not straightforwardly compatible with the observations from the previous sections. Recall the argument from section 2.2 that HNPS cannot target a position on the verbal spine that is higher than the lowest point of attachment for adjunct clauses that are subject to the Revised Larson's Generalization. I suggested instead that the need to bind a parasitic gap is licensing exceptional rightward movement. We saw evidence in section 4 that this rightward movement is indeed targeting positions well beyond the reach of standard HNPS. These observations suggest that it is not the HNPS operation that is responsible for licensing a parasitic gap. Instead, as also suggested by Heck and Müller (2000) for German *wh*-scrambling, it is the parasitic gap that is licensing the movement. We can accommodate these observations, though, with only a minor adjustment to Nissenbaum's (2000) analysis of parasitic gaps alongside a few other assumptions, which I will introduce below.

First, instead of forcing the parasitic gap domain to merge counter-cyclically below the locus of HNPS, we will allow the parasitic gap domain to merge cyclically above the locus of HNPS. The result is shown below in (62) where the *because*P has been adjoined to an extended verbal functional projection XP that dominates the DP that has undergone HNPS.

(62)



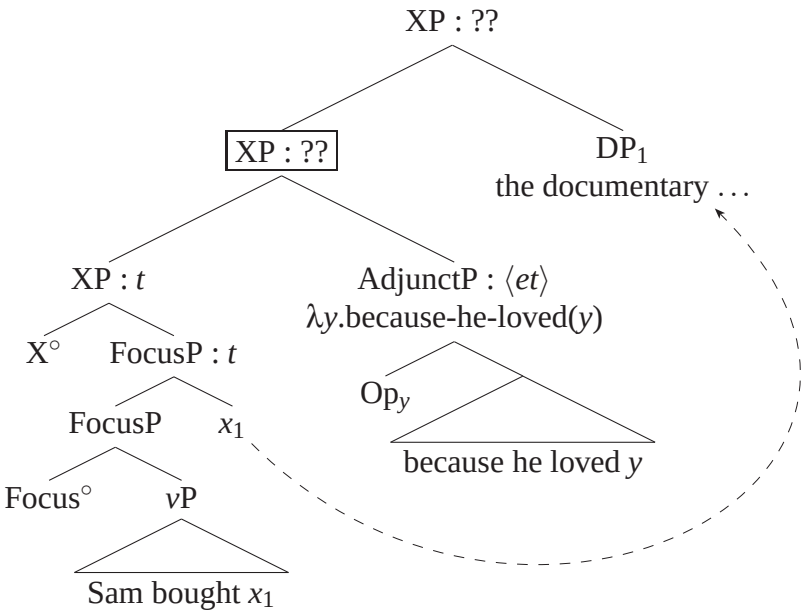

As indicated, this will ultimately result in a type mismatch that renders the XP

[25] See Culicover 2001 for an extensive discussion of parasitic gaps constructions.

node uninterpretable by standard methods of composition (Heim and Kratzer, 1998). Assuming that compositionality is a requirement for the convergence of a phase, then according to the EMM an application of movement that could permit interpretation of the XP node would be licensed.

I suggest that the rightward displacement of the DP over the adjunct clause does exactly this. The result is shown below in (63) where the DP *the documentary* ... has undergone an exceptional instance of rightward movement beyond HNPS and over the clausal adjunct to a position adjoined to the XP node.[26]

(63)




A few words will be necessary here to see exactly how composition of XP is supposed to be ensured by this movement operation. Notice that the standard treatment of movement from Heim and Kratzer 1998 will not actually help here. The binder index that we expect to be inserted along with movement will appear immediately below the the landing site of the displaced DP. This would create a

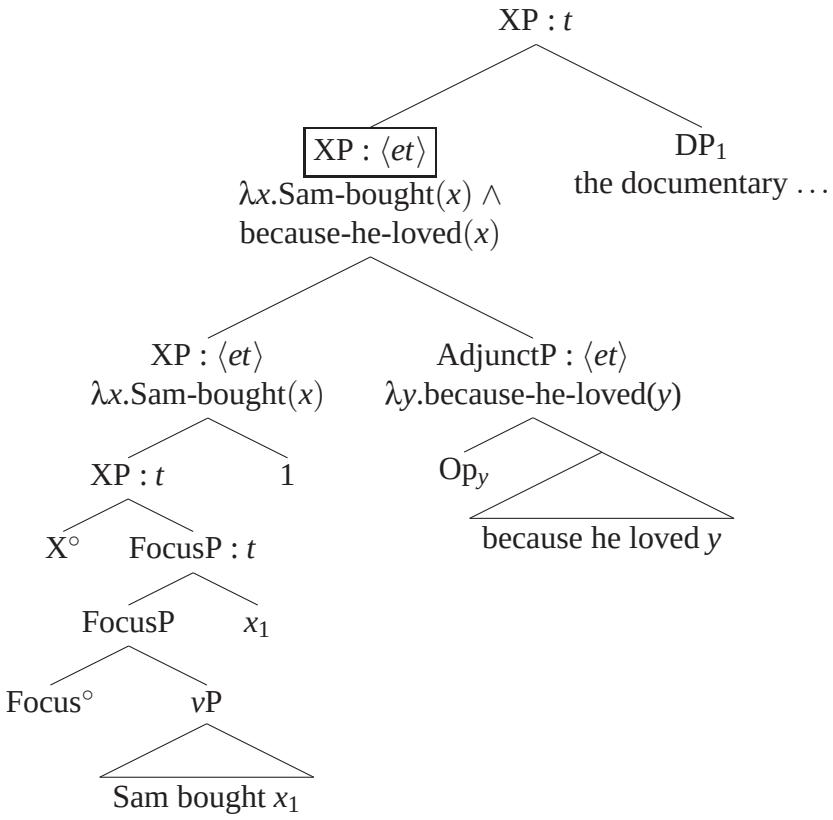
[26] At this point, one might wonder whether the initial step of movement to the low FocusP is always necessary or whether a single step of movement licensed solely by the parasitic gap is possible. In personal communication with Anton Karl Ingason it came out that, if the latter were possible, we should find that rightward movement that is not supported by the discourse context is available given a parasitic gap. Based on the analysis being proposed here, this should in principle be possible. It is not clear that this is the case, which might mean that HNPS is required to feed further rightward movement. This issue presents a clear direction for further research.

derived predicate immediately above the [XP] node, but it would do nothing to facilitate composition of the [XP] node itself with the matrix clause.

To remedy this situation, let us make a second assumption. We will continue to employ the basics of the treatment of movement proposed in Heim and Kratzer 1998, but we will assume that the binder index introduced with an operation of movement need not appear immediately below the moved element. Suppose in particular that the binder index can be merged counter-cyclically to a position non-local to the moved phrase so long as the result is semantically interpretable. It is this ability to non-locally merge the binder index that makes the repair of the type mismatch above in (63) possible. As shown in (64) below, after the displaced DP moves and is adjoined to the [XP] node, the syntactic operation responsible for introducing a binder index counter-cyclically targets the type *t* XP node. This introduces an additional XP node into the structure that is a type $\langle et \rangle$ derived predicate. This in turn allows the previously uninterpretable [XP] node to be interpreted as the semantic conjunction of the new type $\langle et \rangle$ XP 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).[27]

[27] A non-trivial issue, which also pointed out by Nissenbaum (2000) and credited to Irene Heim, is how the structure in (64) 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.

(64)




Before concluding, let us return briefly to a pair of examples that were introduced in footnote 2. I have provided these examples in (65) and (66) below and I have suppressed any grammaticality judgments for them.

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

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

According to a number of native speakers that I have consulted, the examples in (65) and (66) are an improvement over examples like (4), repeated here as (67). The relative difference is whether the potential parasitic gap site is filled with the pronominal *him* or the full DP *my aunt*.

(67) * I offended $e_1$ by not recognizing my aunt immediately –
[my favorite uncle from Cleveland]$_1$.

Both of the anonymous reviewers point out that the acceptability of such examples would not obviously follow directly from the account that I provided in

section 2.2 or from the formal analysis that I have provided here.

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 type of 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 pronounced version of a parasitic gap. The marginality and dialectal variation that I have observed surrounds 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 (1995, 2000), Reinhart (1995, 2006) and Takahashi (2006) 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 and 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 (65) and (66) would be licensed. This analysis would also correctly rule examples like (67) 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.

To conclude this subsection, it is interesting to note that the ultimate effect of this analysis is that the movement of the DP is an instance of overt type-driven movement. Thus, it is analogous in ways to the independently argued for covert operation of quantifier raising (May, 1985; Rooth, 1985). In the same 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 the additional step of movement at the point in the derivation shown in (64) permit composition of the adjunct clause and the matrix clause. It is this ability to ensure the convergence of the spell-out domain that, according to the EMM, licenses what we have seen is exceptional and otherwise illicit rightward movement.

Assuming this analysis to be the correct one, we are also lead to an interesting conclusion about the EMM, which is repeated below.

(68) *Economy of Movement Metric (EMM)*
If a derivation $D_1$ of a spell-out domain $\alpha$ converges without some movement operation, then $D_1$ blocks a derivation $D_2$ of $\alpha$ that includes that movement operation.

The EMM as formulated is a transderivational economy constraint. For us its reference set contains derivations that involve rightward movement beyond standard HNPS and derivations that do not. Because this exceptional movement is type-driven, the metric on which these derivations are being evaluated is not found in the syntax or in the derivations themselves. Instead, whether or not a spell-out domain converges is being determined by the ability to interpret the LF representation of that spell-out domain. The reference set computation performed by the EMM, then, is in a sense interpretation-dependent in a way that is again analogous to QR according to Fox (1995, 2000) and Reinhart (1995, 2006). The EMM must have access to the LF component in order to determine whether an instance of movement affects interpretability.

### *5.3. Multiple Parasitic Gap Domains*

Having seen up to this point that rightward DP-movement is potentially unbounded when licensed by the presence of a parasitic gap domain, 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) argues is possible for instances of RNR of a DP that are amenable to an Across-the-Board extraction analysis.

Let us consider the sentences in (69), which have been modeled on examples from Nissenbaum 2000, 64.

(69) 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 [$pg_1$] 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.[28] For Nissenbaum (2000, 61–64), this paradigm is a consequence of a requirement to counter-cyclically adjoin clausal adjuncts to a position above the binder index introduced by the HNPS operation. This effectively forces any and all clausal adjuncts that appear to the left of the shifted DP to compose with a type $\langle et \rangle$ node (FocusP in (60)). This in turn requires that they themselves be a type $\langle et \rangle$ parasitic gap domain. It is this way, in fact, that Nissenbaum accounts for the preliminary version of Larson's Generalization in (6).

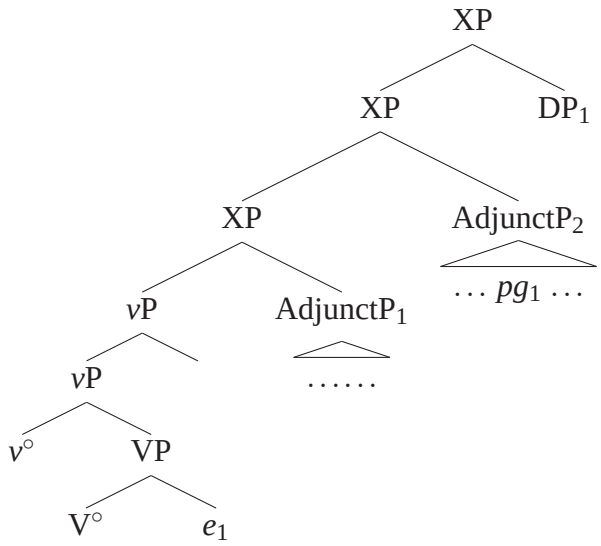
In light of the claim that it is the presence of a parasitic gap domain that is licensing exceptional rightward DP movement, then the paradigm in (69) can be seen as revealing that this exceptional instance of movement does not always proceed via a single application of movement. If this were the case, and movement of a DP to a position where it could provide a binder for a parasitic gap 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. More concretely, in a structure like the one sketched in (70), the presence of the parasitic gap in AdjunctP$_2$ should be able to motivate the exceptional step of movement over AdjunctP$_1$, which lacks a parasitic gap.

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

(i) a. Sam thinks [$_{CP}$ that you promoted $e_1$ without interviewing $pg_1$]
because he saw you give $pg_1$ a raise –
the guy with a reference from Al Gore.

b. * Sam thinks [$_{CP}$ that you promoted $e_1$ without interviewing Kim]
because he saw you give $pg_1$ a raise –
the guy with a reference from Al Gore.

(70)




The contrast between (69a) and (69b) suggests instead that each instance of movement over each adjunct clause must be independently licensed. In terms of the analysis being built here, there appears to be a requirement for the displaced DP to move through a position above each individual parasitic gap domain.

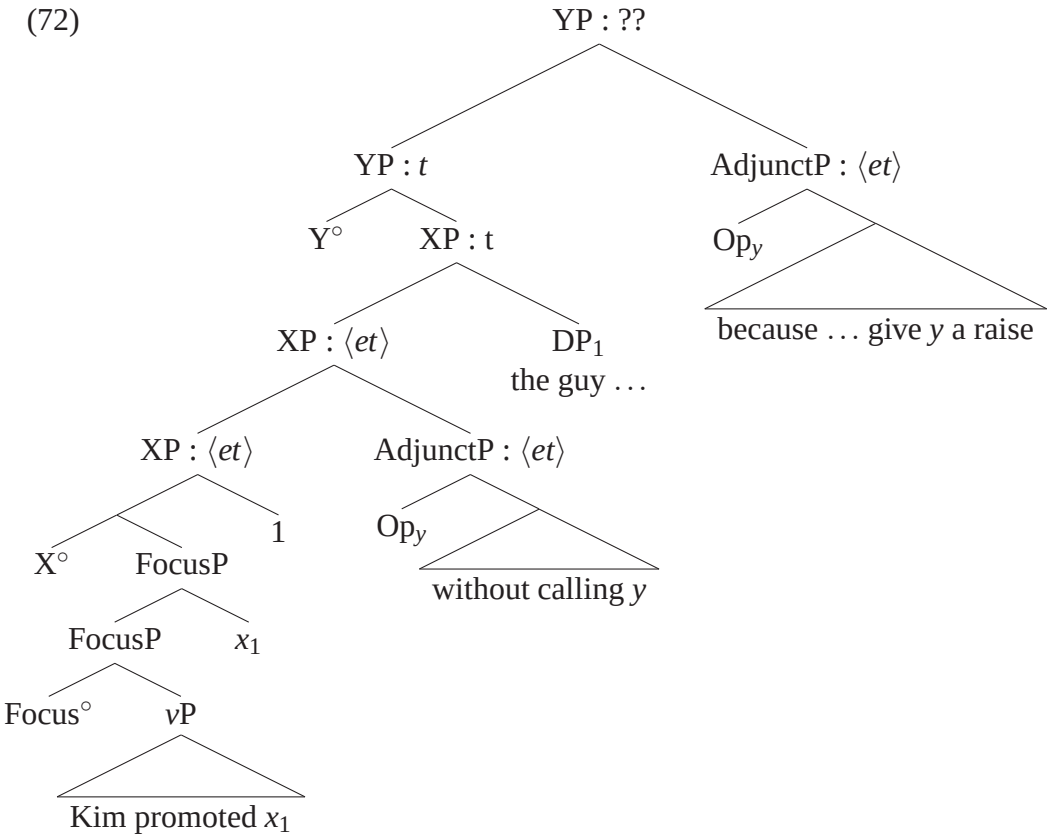
Still assuming that the derivation of a syntactic object involves multiple spell-outs, we can begin to formalize this requirement by assuming that there is an enriched inventory of spell-out domains that lie between *v*P and CP (cf. Chomsky, 2000, 2001) and by asserting that the adjunct clauses that are subject to the Revised Larson's Generalization necessarily reside in separate spell-out domains.[29] This constraint on the distribution of clausal adjuncts is designed to block precisely the type of configuration in (69b). The effect is that the EMM will need to be satisfied multiple times, once in the spell-out domain containing the lower adjunct clause and again in the spell-out domain containing the higher adjunct clause. This means that the displaced DP must move through a position above the adjunct clause that is in each spell-out domain. It is only in this way that each parasitic gap domain can be permitted to compose with the matrix clause. To see this let us look closer at (69a) which is repeated below as (71).

[29] I will remain intentionally vague with regard to precisely how these ideas should be formalized. However, in section 5.4 below, I will adopt the idea that spell-out is triggered whenever the derivation produces a representation that would be convergent at the interfaces (Obata, 2006; Narita, 2011). Alternatively, one might pursue the idea that every phrase constitutes a spell-out domain (e.g. Müller, 2011) or even that every syntactic object produced in the course of a derivation is a spell-out domain (Epstein and Seely, 2002).

(71) 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]$_1$.

We can pick up the derivation of this example at the point shown in (72). In the lower spell-out domain XP, the DP$_1$ *the guy* ... underwent an instance of exceptional movement to the edge of XP immediately above the *without*P. In the same way as we saw above, the EMM will have determined that movement of DP$_1$ in the derivation of XP was licensed by virtue of repairing the resulting type-mismatch between the *without*P, which contains a parasitic gap, and the matrix clause.

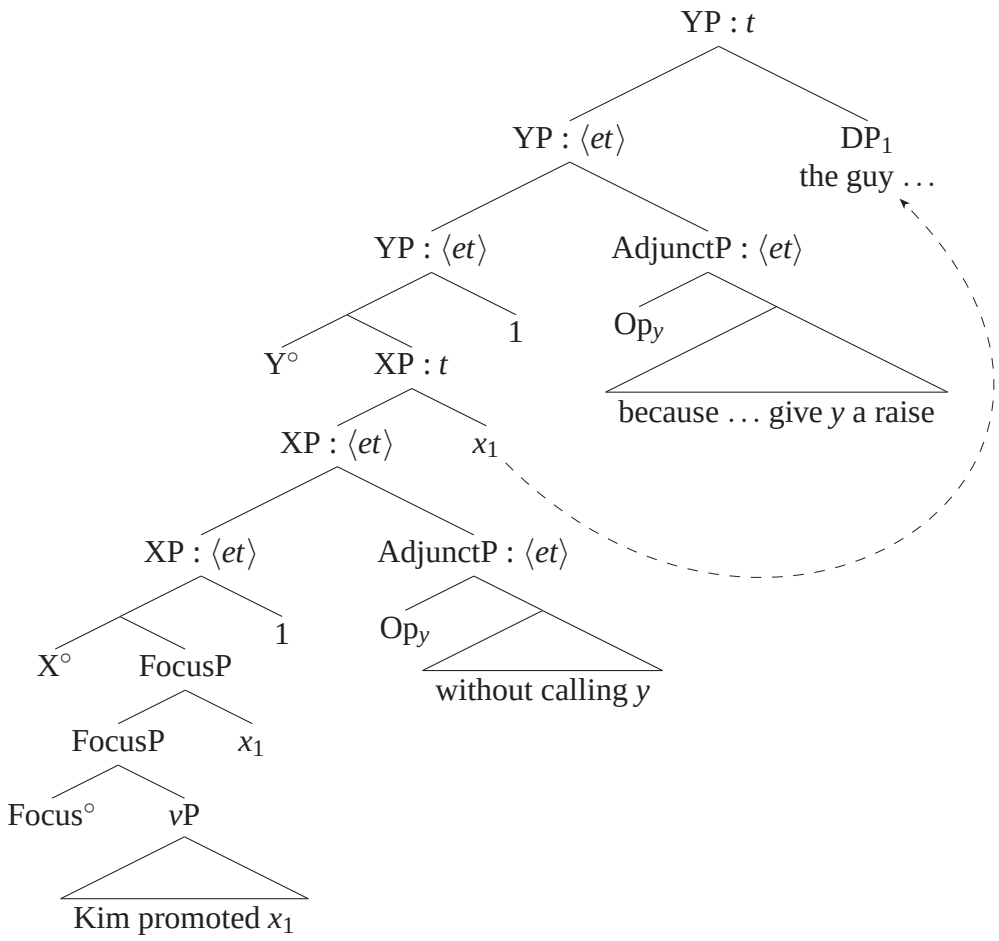
(72)




The *because*P has been merged into the structure above as part of a higher spell-out domain YP. Recall that this will be required by our constraint against the two AdjunctPs both being merged into the same spell-out domain XP. The situation now is a familiar one. An additional application of movement of DP$_1$ to Spec,YP is licensed in the derivation of YP according to the EMM. It is this movement that

will ensure composition of the *because*P and the matrix clause and, thus, ensure convergence of YP. The result is illustrated by the example in (73) where we see the relevant partial representation for the sentence in (71).

(73)




While the present system will account for (69a)/(71), we will require something more than what we have gathered up to this point in order to entirely account for the ungrammaticality of (69b), which has been repeated as (74).

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

Appropriately augmenting the system will be the purpose of the following subsection. However, we can note here that we correctly rule out a derivation of (69b)/(74) whereby the displaced DP moves cyclically through the edge of each

spell-out domain. Recall from the discussion surrounding (57) that, according to the EMM, movement over an adjunct clause that is subject to the Revised Larson's Generalization is unlicensed in the absence of a parasitic gap. It is for the same reason that movement to the edge of the lower spell-out domain containing the *without*P will be blocked. We will return to this example in the following subsection where we will close the apparent loop-hole which would currently allow movement directly to the edge of the higher spell-out domain containing the *because*P and which would effectively circumvent the EMM violation.

*5.4. An Apparent Paradox*

Taking stock again, we have seen that parasitic gaps license movement beyond standard HNPS and that the presence of multiple parasitic gaps domains will require 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. Given this, Nissenbaum's example of long-distance rightward movement in (51) above and the modified example in (52) 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, 1995, 2000), there would be no non-stipulative way of satisfying the EMM and licensing movement of the DP beyond the standard HNPS operation to the edge of the embedded CP in those examples. This presents a paradox wherein the paradigm in (69) seems to show us that the relevant movement proceeds successive-cyclically while (51) and (52) 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 and 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.[30] 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 via local applications of movement. I will argue here that this assumption about movement, in addition to maintaining the EMM, provides a way of accounting for these seemingly contradictory data.

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

Let us begin by following Sabbagh's 2007 analysis of RNR and adopting the basic framework of Cyclic Linearization proposed by Fox and Pesetsky (2005). This system starts with the proposal we have already adopted that derivations proceed cyclically via multiple spell-outs of the syntactic object under construction. We will follow Ko (2007) in particular in taking (at least) *v*P and CP to constitute spell-out domains. When one of these phrases has been completely built, it is sent to the phonological component where it is fed into a linearization algorithm *Lin*(). This algorithm will establish the relative linear order of each syntactic element and compile the information 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, linear ordering statements can only be added to the list.

(75) *Order Preservation* (Fox and 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 it should be the case that an ordering statement established in one instance of spell-out contradicts an ordering statement established in a preceding instance of spell-out, linearization would 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 and it would therefore be illicit.

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 (76a), 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 (76b), $X$ 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.

(76) a. $[_{\alpha}$ A X $]$
*Lin*(α): A < X

b. * $[_{\beta}$ X $[$ B $[_{\alpha}$ A ~~X~~ $]]]$
*Lin*(α): **A** < **X**
*Lin*(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 (77a). In

this case, the ordering statement $X < A$ is established at the spell-out of α. Further movement of $X$ into β now does not contradict the previously established ordering statement at spell-out of β (77b).

(77) a. $[_{\alpha}\ \overset{\downarrow}{\text{X}}\ [\ \text{A}\ \overset{\uparrow}{\sout{\text{X}}}\ ]]$
$Lin(\alpha)$: X < A

b. $[_{\beta}\ \overset{\downarrow}{\text{X}}\ [\ \text{B}\ [_{\alpha}\ \overset{\uparrow}{\sout{\text{X}}}\ [\ \text{A}\ \sout{\text{X}}\ ]]]]$
$Lin(\alpha)$: **X** < **A**
$Lin(\beta)$: **X** < B < **A**

In this way, it is spell-out that 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, observe that rightward movement of $X$ will not necessarily need to move through the edge of α. Consider (78) 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 RNR, 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."

(78) a. $[_{\alpha}\ \text{A X}\ ]$
$Lin(\alpha)$: A < X

b. $[_{\beta}\ [\ [_{\alpha}\ \text{A}\ \overset{\uparrow}{\sout{\text{X}}}\ ]\ \text{B}\ ]\ \overset{\downarrow}{\text{X}}\ ]$
$Lin(\alpha)$: **A** < **X**
$Lin(\beta)$: **A** < B < **X**

This is exactly how we account for the vanilla examples of rightward movement and parasitic gap licensing in section 5.2 as well as the examples of long-distance rightward movement and parasitic gap licensing in (52), which has been repeated as (79) 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 a potentially unbounded distance as nothing forces it to make any intermediate stops.

(79) Sam thinks [$_{\text{CP}}$ 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 in (80) below while still assuming that minimally *v*P and CP constitute spell-out domains. The first stage in the derivation, which is shown in (80a), has the embedded $v\text{P}_1$ constructed and spelled-out. The next two stages of the derivation, which are both represented by

(80b), will see the embedded $CP_1$ and the matrix $vP_2$ 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 according to the EMM. In (**??**) we reach the point in the derivation when the parasitic gap domain is adjoined to the matrix clause. Now, even though movement of $DP_1$ was not licensed when the EMM was run at the previous instance of spell-out, the EMM will permit movement of $DP_1$ at the current stage in order to provide a binder for the parasitic gap and ensure convergence of $CP_2$. Furthermore, 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.

(80) a. $[_{vP_1}$ you like $[_{DP}$ one of the co-workers ... $]_1$ $]$
*Lin*($vP_1$): you $<$ like $<$ $DP_1$

b. $[_{vP_2}$ Sam thinks $[_{CP_1}$ that you $[_{vP_1}$ like
$[_{DP}$ one of the co-workers ... $]_1$ $]]]$
*Lin*($vP_1$): you $<$ like $<$ $DP_1$
*Lin*($CP_1$): that $<$ you $<$ like $<$ $DP_1$
*Lin*($vP_2$): Sam $<$ thinks $<$ that $<$ you $<$ like $<$ $DP_1$

c. $[_{CP_2}$ Sam $[_{vP_2}$ thinks $[_{CP_1}$ that you $[_{vP_1}$ like $e_1$ $]]]$
because he saw you give $pg_1$ a present
$[$one of the co-workers ... $]_1]$
*Lin*($vP_1$): you $<$ like $<$ $DP_1$
*Lin*($CP_1$): that $<$ you $<$ like $<$ $DP_1$
*Lin*($vP_2$): Sam $<$ thinks $<$ that $<$ you $<$ like $<$ $DP_1$
*Lin*($CP_2$):Sam $<$ thinks $<$ that $<$ you $<$ like $<$ *because*P $<$ $DP_1$

Of course, this type of long-distance non-successive-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 *v*P 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.

At this point, though, it is still not clear under the analysis being developed here that we entirely rule out the example from (69b)/(71), which is repeated again in (81) below. 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. It must be explained, then, why movement of $DP_1$ cannot be delayed until the introduction of the parasitic gap domain. The reason lies in the earlier assertion that adjunct clauses that are subject to the Revised Larson's Generalization reside in separate spell-out domains along with an assumption regarding the nature of the trigger for the operation Spell-Out. Let it be the case that spell-out is triggered immediately whenever a structure is built that would produce a convergent LF. The intended effect is that if a clausal adjunct that is subject to Larson's Generalization is merged into the derivation without a parasitic gap, spell-out will immediately be triggered before the derivation proceeds. Important for the present discussion is that spell-out will be triggered prior to movement since the resulting structure will converge according to the EMM. What this means for (81) is that the rightward movement of $DP_1$ will be properly licensed by the presence of the parasitic gap in the *because*, but the movement will result in the production of contradictory linearization statements in the course of the derivation.

Consider the derivation of (81) below to see how this is the case. The first step of the derivation in (81a) shows the point at which the *v*P has been built and spelled out. The stage of the derivation in (81b) is the point at which the spell-out domain XP containing the lower adjunct clause has been built. Because there is no parasitic gap in the *without*P requiring a binder, the EMM deems rightward movement of $DP_1$ over the *without*P unlicensed at this point and it will remain in the *v*P. At spell-out, then, a linearization statement will be gathered stating that $DP_1$ precedes the *without*P. The example in (81c) shows the point at which the spell-out domain YP containing the higher adjunct clause has been built. The *because*P is a parasitic gap domain and, therefore, rightward movement of the DP is both licensed and required to a position above the *because*P. However, because this movement will result in a linearization statement which says that the *without*P precedes the DP, contradictory linearization requirements arise and the structure is rendered unpronounceable and, therefore, ungrammatical.

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

a. [$_{v\text{P}}$ Kim promoted [$_{\text{DP}}$ the guy … ]$_1$]
*Lin*($v$P): Kim < promoted < DP$_1$

b. [$_{\text{XP}}$ [$_{v\text{P}}$ Kim promoted [$_{\text{DP}}$ the guy … ]$_1$]
without calling management ]
*Lin*($v$P): Kim < promoted < DP$_1$
*Lin*(XP): Kim < promoted < DP$_1$ < *without*P

c. * [$_{\text{YP}}$ [$_{\text{XP}}$ [$_{v\text{P}}$ Kim promoted $e_1$] *without*P ]
because she wanted to give $pg_1$ a raise [$_{\text{DP}}$ the guy … ]$_1$]
*Lin*($v$P): Kim < promoted < DP$_1$
*Lin*(XP): Kim < promoted < **DP**$_1$ < ***without*P**
*Lin*(YP): Kim < promoted < ***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.

The preceding discussion has employed several aspects of the system that has been developed in this section. I have argued that applications of movement are evaluated at the level of each spell-out domain. This has been formalized as the EMM in (58). I have also proposed that spell-out has a rolling trigger that sends the syntactic object off for interpretation at the interfaces whenever the result would converge at LF and, furthermore, that the adjunct clauses that are subject to the Revised Larson's Generalization cannot occupy the same spell-out domain. Looking back, we can see these pieces working together in the acceptability of (69a), which contained multiple parasitic gap domains that license successive-cyclic movement. The rightward movements over each adjunct clause illustrated in (73) are appropriately licensed by the presence of a parasitic gap in each of them. The result is that the displaced DP moves through the edge of each spell-out domain containing an adjunct clause. At each instance of linearization, then, the rightward moving DP will continuously be linearized to the right of the elements being merged into the structure and, in this way, it avoids being involved in contradictory linearization statements.

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.

## 6. Conclusion

The primary goal of this paper was to provide an account for the observation by Larson (1989) that rightward DP-movement past particular clausal adjuncts requires a parasitic gap. As I argued in section 2, this rightward movement is exceptional in that rightward DP-movement is not otherwise able to target a position above these particular adjuncts. Inspired by an observation in Heck and Müller 2000, I suggested that the movement is licensed in the presence of a parasitic gap. Using the basic analysis of parasitic gap constructions in Nissenbaum 2000 as the groundwork, I formalized this analysis in subsections 5.1 and 5.2 in terms of the ability of this exceptional rightward to permit composition of the matrix clause and the adjunct clause. This analysis also has the benefit of allowing us to provide an account for the fact that leftward movement over the same adjunct clauses does not necessitate a parasitic gap as we saw from (3) and (5) in the introduction. The reason for the asymmetry can be attributed to the difference in licensing conditions. Whereas rightward DP movement beyond *v*P is exceptionally licensed to ensure composition of a parasitic gap domain, leftward movement, such as wh-movement, will be independently licensed to a position that is higher than the clausal adjuncts that are subject to the Revised Larson's Generalization. The need satisfy the scopal requirements of question-formation will license movement to Spec,CP entirely independent of the presence of a clausal adjunct or a parasitic gap. Thus, we expect to find, as we do, that a parasitic gap will be optional in these cases.

It was also argued in sections 4 and 5 that rightward movement and the licensing of parasitic gaps is very much like RNR of DPs according to Sabbagh (2007). Both can in principle be seen as unbounded movement operations (section 4) and may be forced to proceed successive-cyclically by a confluence of constraints placed on the interface components (section 5). 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 can be viewed as superficial

differences that happen to be reflexes of the principles of linearization and the EMM. 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 the observable differences may be attributable to the particular factors that license and constrain any given instance of movement, leftward or rightward.

However, this still leaves us with a couple of questions. Why are some movements linearized rightward and others leftward? And why should it be the case that standard HNPS is restricted to the edge of *v*P and that further rightward movement, but not further leftward movement, requires some additional mechanism. The answer to the second question, I would like to speculate, may be found in the correlation that exists, at least in English, between the direction of an instance of $\overline{\text{A}}$-movement and the domain it targets. Leftward $\overline{\text{A}}$-movements are those movements that target a CP layer. The instance of rightward movement examined here, on the other hand, is an instance of $\overline{\text{A}}$-movement targeting the *v*P layer (under standard circumstances). Now, if we start to consider the discourse-function and semantic interpretation of each type of movement, we begin to account for their locality conditions. As noted just above, *Wh*-question formation independently requires a *wh*-element to take scope over an entire proposition at the level of CP. Still assuming that HNPS serves to indicate presentational focus, then we seem to be observing that this interpretation can be achieved at the level of *v*P as opposed to a position that has scope over the whole of the asserted content. This behavior can be accounted for by maintaining an interpretation-dependent version of the EMM. Basically, if an intended interpretation can be achieved via a derivation $D_1$ that lacks and operation of movement, a derivation $D_2$ that includes that operation of movement is blocked by $D_1$. Adopting something along these lines would then allow us to reframe the first question in an interesting way: why are short movements being linearized to the right, while long movements are being linearized to the left?

## Appendix A. Experimental Items

(1) a. No judge should contact, in order to give his scoresheet (to), the contestants in this month's competition.

b. No judge should contact, and give his scoresheet (to), the contestants in this month's competition.

c. No judge should contact the contestants in this month's competition, in order to give his scoresheet (to).

d. No judge should contact the contestants in this month's competition, and give his scoresheet (to).

(2) a. No woman could meet, in order to give her yearbook (to), the person she roomed with in college.

b. No woman could meet, and give her yearbook (to), the person she roomed with in college.

c. No woman could meet the person she roomed with in college, in order to give her yearbook (to).

d. No woman could meet the person she roomed the in college, and giver her yearbook (to).

(3) a. No fireman should befriend, in order to give his groceries (to), the homeless people outside the station.

b. No fireman should befriend, and give his groceries (to), the homeless people outside the station.

c. No fireman should befriend the homeless people outside the station, in order to give his groceries (to).

d. No fireman should befriend the homeless people outside the station, and give his groceries (to).

(4) a. No nurse could save, after giving her blanket (to), the victims of the most recent tornado.

b. No nurse could save, and give her blanket (to), the victims of the most recent tornado.

c. No nurse could save the victims of the most recent tornado, after giving her blanket (to).

d. No nurse could save the victims of the most recent tornado, and give her blanket (to).

(5) a. No landlady should evict, after giving her key (to), the tenants causing trouble around the building.

b. No landlady should evict, and her key (to), the tenants causing trouble around the building.

c. No landlady should evict the tenants causing trouble around the building, after giving her key (to).

d. No landlady should evict the tenants causing trouble around the building, and give her key (to).

(6) a. No boss would punish, by giving his work (to), the interns who regularly show up late.

b. No boss would punish, and his work (to), the interns who regularly show up late.

c. No boss would punish the interns who regularly show up late, by giving his work (to).

d. No boss would punish the interns who regularly show up late, and give his work (to).

(7) a. No officer could calm, because he gave his warning (to), the people who were parking in the street illegally.

b. No officer could calm, and give his warning (to), the people who were parking in the street illegally.

c. No officer could calm the people who were parking in the street illegally, because he gave his warning (to).

d. No officer could calm the people who were parking in the street illegally, and give his warning (to).

(8) a. No man would thank, before giving his car (to), the valets working outside this restaurant.

b. No man would thank, and give his car (to), the valets working outside this restaurant.

c. No man would thank the valets working outside this restaurant, before giving his car (to).

d. No man would thank the valets working outside this restaurant, and give his car (to).

(9) a. No women could contact, before telling her mission (to), the undercover spy that the company hired.

b. No women could contact, and tell her mission (to), the undercover spy that the company hired.

c. No women could contact the undercover spy that the company hired, before telling her mission (to).

d. No women could contact the undercover spy that the company hired, and tell her mission (to).

(10) a. No chef would fire, after telling his recipe (to), the people that were hired to help in the kitchen.

b. No chef would fire, and tell his recipe (to), the people that were hired to help in the kitchen.

c. No chef would fire the people that were hired to help in the kitchen, after telling his recipe (to).

d. No chef would fire the people that were hired to help in the kitchen, and tell his recipe (to).

(11) a. No captain would rescue, because he told his destination (to), the sailors that were found stranded at sea.

b. No captain would rescue, and tell his destination (to), the sailors that were found stranded at sea.

c. No captain would rescue the sailors that were found stranded at sea, because he told his destination (to).

d. No captain would rescue the sailors that were found stranded at sea, and tell his destination (to).

(12) a. No inspector should interrogate, after telling his technique (to), the person suspected to be guilty of the crime.

b. No inspector should interrogate, and tell his technique (to), the person suspected to be guilty of the crime.

c. No inspector should interrogate the person suspected to be guilty of the crime, after telling his technique (to).

d. No inspector should interrogate the person suspected to be guilty of the crime, and tell his technique (to).

(13) a. No boy should annoy, by telling his hobbies (to), the girls who sit next to him on the bus.

b. No boy should annoy, and tell his hobbies (to), the girls who sit next to him on the bus.

c. No boy should annoy the girls who sit next to him on the bus, by telling his hobbies (to).

d. No boy should annoy the girls who sit next to him on the bus, and tell his hobbies (to).

(14) a. No librarian should scare, by telling her penalty (to), the people who keep books past the return date.

b. No librarian should scare, and tell her penalty (to), the people who keep books past the return date.

c. No librarian should scare the people who keep books past the return date, by telling her penalty (to).

d. No librarian should scare the people who keep books past the return date, and tell her penalty (to).

(15) a. No salesman should encourage, before telling his motive (to), the people who are unsure about buying a car.

b. No salesman should encourage, and tell his motive (to), the people who are unsure about buying a car.

c. No salesman should encourage the people who are unsure about buying a car, before telling his motive (to).

d. No salesman should encourage the people who are unsure about buying a car, and tell his motive (to).

(16) a. None of the sergeants could gather, in order to tell his strategy (to), the commanding officers in charge of protecting the city.

b. None of the sergeants could gather, and tell his strategy (to), the commanding officers in charge of protecting the city.

c. None of the sergeants could gather the commanding officers in charge of protecting the city, in order to tell his strategy (to).

d. None of the sergeants could gather the commanding officers in charge of protecting the city, and tell his strategy (to).

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