University of Pennsylvania Working Papers in Linguistics

Volume 23
Issue 1 *Proceedings of the 40th Annual Penn Linguistics Conference*

Article 30

1-1-2017

Pseudo-gapping: Evidence for Overt Quantifier Raising

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Abstract
This paper explores the grammatical process of pseudo-gapping. In the literature, pseudo-gapping has been analyzed as a series of two operations: the syntactic movement of a remnant out of a VP (Move-R) and the phonological deletion of the VP (VP-deletion). Given this movement + deletion theory, I address what type of movement Move-R is. This paper makes a new argument against Takahashi's (2004) approach, and for Johnson's (2008) approach; the former identifies Move-R with the combination of Heavy NP Shift and Object Shift, while the latter identifies it with Quantifier Raising (QR), whose output is covert in general cases. Specifically, it is shown that the latter, but not the former, can predict two facts: that the object of a preposition in an NP-PP argument construction can be a remnant and that no predicate NP can be a remnant. The QR approach is then extended by adopting the single output model of syntax (e.g., Bobaljik 1995). In particular, a new phonological theory of QR is proposed, which provides four possible ways to reduce the chain of QR, depending on whether VP-deletion applies and whether the moved element is focused. This new theory is shown to explain why the output of QR can be overt in pseudo-gapping. Considering the possibility of overt QR, this paper concludes by arguing against the traditional T model of grammar, or the dual output model of syntax (e.g., Chomsky and Lasnik 1977).

Pseudo-gapping: Evidence for Overt Quantifier Raising

Hideharu Tanaka*

1 Issue: The Identity of Movement in Pseudo-gapping

This paper investigates the grammatical process of *pseudo-gapping* (e.g., Levin 1979). Pseudo-gapping yields an ellipsis clause which lacks a main verb and consists of at least three other elements: a subject, a finite auxiliary, and a non-verbal phrase such as an accusative NP or a locative PP. We especially refer to the third element as a *remnant*. This type of ellipsis clause, or the pseudo-gapping construction, is exemplified by the *but*-clause in (1); the underlined blank signals something elided, the subject is *she*, the auxiliary is *does*, and the remnant is the object *Tom*.

(1) Mary doesn't like John, but she does __ Tom.

Note that the interpretation for pseudo-gapping is anaphoric and contrastive, involving a pair of clauses. One is a *target clause*, part of which is elided by pseudo-gapping, and the other is an *antecedent clause*, some part of which is referred back to by the elided part, and other part of which the remnant is contrasted with; call this part a *correlate*. In (1), for example, the elided part of the target clause is understood as *like*, which appears in the antecedent clause, and the correlate is *John*. In this paper, we mainly focus on how to derive the output form of pseudo-gapping.

In the literature, some researchers have proposed a *movement + deletion theory of pseudo-gapping* (e.g., Jayaseelan 1990, Lasnik 1999). This theory analyzes pseudo-gapping as a combination of two operations: the syntactic movement of a remnant (hereafter, *Move-R*) and the phonological deletion of the VP from which the remnant is extracted (hereafter, *VP-deletion*). Thus, the derivation of pseudo-gapping under the movement + deletion theory proceeds as shown in (2).

(2) I. At the syntactic component:
[she [does [**Tom** [like ***t***]]]]
Move-R

II. At the phonological component:
[she [does [**Tom** ~~[like ***t***]~~]]]
VP-deletion

Note that this analysis is supported by the data in (3), which is from Johnson 2008. First, pseudo-gapping shows island sensitivity. In (3b), the remnant is understood as the object originating in the *wh*-infinitive (i.e., *when to buy*). Its ungrammaticality suggests that the remnant reaches its surface position by moving out of the elided *wh*-infinitive, inducing a *wh*-island violation. Second, pseudo-gapping can involve ellipsis of more than a main verb. In (3a), what is elided corresponds to the matrix VP excluding the remnant (i.e., *try to buy*). This non-constituent ellipsis is predicted if we assume that VP-deletion applies to the matrix VP after the remnant is moved out. Given this empirical support, we adopt the movement + deletion theory in this paper.

(3) a. Will might *try to buy* kale, but he won't __ asparagus.
b. *Will might *decide when to buy* kale, but he won't __ asparagus. (Johnson 2008:71)

We now address a controversial issue for the movement + deletion theory. That is, what type of movement is Move-R? This issue has been discussed in several approaches. Among them, we choose to verify two approaches, Takahashi 2004 and Johnson 2008, since both have not been refuted for any appropriate reasons. Takahashi proposes to unify Jayaseelan's (1990) and Lasnik's (1999) approaches, claiming that both *Heavy NP Shift* (HNPS) and *Object Shift* (OS) can serve as Move-R. On the other hand, Johnson proposes to identify Move-R with *Quantifier Raising* (QR),

*This paper is based on Chapter 2 of my unpublished dissertation, and an earlier version of this paper was given at the Syntax Workshop at the University of Massachusetts, Amherst. I particularly thank Sadayuki Okada for his comments on my dissertation. Many thanks also go to Ian Garlington, Leland Kusmer, Nicholas LaCara, Rebecca Woods, and especially Kyle Johnson, for their discussion and help as informants. This work was aided by the International Travel Award Project for Doctoral Students at Osaka University.

which is generally assumed to be "covert" movement. The question is which approach is superior.[1]

In this paper, we argue for an extension of Johnson's QR approach in the following manner. Section 2 develops a new argument against Takahashi's eclectic approach and for Johnson's QR approach. Section 3 extends Johnson's QR approach by proposing a new chain reduction algorithm for QR within the *single output model of syntax* (e.g., Bobaljik 1995). We show that our proposal answers a question not addressed in Johnson 2008: why the output of QR can be overt in pseudo-gapping. Section 4 concludes with a theoretical implication of our proposal, making an argument against the *dual output model of syntax* (e.g., Chomsky and Lasnik 1977).

2 Discussion: Comparing Two Approaches to Pseudo-gapping

2.1 Arguments Against Takahashi's (2004) Eclectic Approach

Let us begin by verifying Takahashi's (2004) eclectic approach to the identity of Move-R. As noted above, he identifies Move-R with the combination of HNPS and OS (cf. Jayaseelan 1990, Lasnik 1999), allowing remnants to undergo either of them. Under his assumptions, HNPS is rightward A′-adjunction to the edge of *v*P above VP, while OS is leftward A-movement to the edge of a functional category XP above *v*P, as shown in (4). The point of Takahashi's idea is flexibility in movement options; if either of HNPS and OS is unavailable, the remnant can undergo the other.

(4) a. HNPS
[she [does [$_{vP}$ ~~[$_{vP}$ like ***t***]~~ **Tom**]]]

b. OS
[she [does [$_{XP}$ **Tom** ~~[$_{vP}$ like ***t***]~~]]]

Takahashi's empirical basis comes from the *double object construction* (DOC). As shown in (5), either the indirect object (IO) or the direct object (DO) can be a remnant. He claims that this paradigm can only be captured under his eclectic approach. Specifically, he claims that (5a) must be derived by HNPS and that (5b) must be derived by OS, as shown in (6).

(5) a. Although John wouldn't give Bill the book, he would ~~give Bill~~ [$_{DO}$ the paper].
b. Although John wouldn't give Bill the book, he would ~~give~~ [$_{IO}$ Susan] ~~the book~~.
(Takahashi 2004:572–573)

(6) a. DO → HNPS
[$_{vP}$ ~~[$_{vP}$ give Bill ***t***]~~ **the paper**]]

b. IO → OS
[$_{XP}$ **Susan** ~~[$_{vP}$ give ***t*** the book]~~]

First, assuming that English OS behaves in the same way as Icelandic OS, he argues that the DO remnant in (5a) cannot be created by OS, because DO cannot undergo OS in Icelandic, as shown in (7c). Given this, he suggests that (5a) be derived by HNPS, which is applicable to DO (see 8a).

(7) a. *Mannræninginn* *skilaði* ***aldrei*** [$_{IO}$ *foreldrunum*] [$_{DO}$ *börnunum*].
kidnapper-the returned never parents-the(Dat) kids-the(Dat)
"The kidnapper never returned the kids to the parents."
b. *Mannræninginn* *skilaði* [$_{IO}$ *foreldrunum*]$_1$ ***aldrei*** ***t***$_1$ [$_{DO}$ *börnunum*].
c. **Mannræninginn* *skilaði* [$_{DO}$ *börnunum*]$_1$ ***aldrei*** [$_{IO}$ *foreldrunum*] ***t***$_1$.
(Thráinsson 2001:153)

Second, he argues that the IO remnant in (5b) cannot be created by HNPS, because IO cannot undergo HNPS, as shown in (8b). This allows him to suggest that (5b) be derived by OS, since it is applicable to IO (see 7b).

[1]Other approaches are (i) the *Focus Movement* approach (e.g., Gengel 2013), which subsumes Move-R in an A′-movement to the functional category FocP projected above *v*P, and (ii) the *Dutch Scrambling* approach (e.g., Baltin 2003), which identifies it with an optional A-movement in Dutch. For problems with (i) and (ii), see Baltin 2003:240–243 and Hoeksema 2006:5, respectively. Note that as a variant of (i), Thoms (2016) proposes the need of QR of the correlate, deriving it from a scope parallelism condition on ellipsis. Although his proposal is insightful, we leave a detailed examination of it for the future research.

(8) a. John gave Bill ***t*** yesterday [$_{DO}$ more money than he had ever seen].
b. *John gave ***t*** a lot of money [$_{IO}$ the fund for the preservation of VOS languages].
(Lasnik 1999:143)

Thus, the DOC paradigm in (5) lends support to the view of Move-R as the combination of HNPS and OS; it is flexible enough to capture the availability of IO and DO remnants.

However, we point out that Takahashi's eclectic approach is faced with at least two problems: it both undergenerates and overgenerates on other empirical domains. To begin with, the problem of undergeneration involves an *NP-PP argument construction* (NPAC), where the internal arguments of the V are realized as an NP and a PP, with no alternation to the double object frame. An instance of the NPAC is given in (9). The point is that the object of a preposition in the NPAC (P-Obj, e.g., *Mary* in *from Mary*) can be a pseudo-gapping remnant, as illustrated in (10b).

(9) You can borrow [$_{NP}$ a car] [$_{PP}$ from [$_{P\text{-}Obj}$ Mary]].
(10) a. You cannot *borrow a car* from John, but you can __ from Mary.
b. ?You cannot *borrow a car from* John, but you can __ Mary.

Although (10b) is somewhat marginal, Levin (1979) observes similar examples from natural conversation, as shown in (11). Thus, we assume (10b) as grammatical, at least for some speakers.

(11) a. You can't *take the lining out of* that coat. You can __ this one.
b. It [an enema] *leaves some water in* you. At least, it does __ me. (Levin 1979:15–16)

Given this, we argue that the eclectic approach fails to predict the availability of P-Obj remnants. First, HNPS cannot derive (10b), since it cannot apply to P-Obj in the NPAC (and in general):

(12) a. You can borrow a car [from [the female graduate student of natural language processing]] tomorrow.
b. *You can borrow a car [from ***t***$_1$] tomorrow [the female graduate student of natural language processing]$_1$.

Second, OS cannot derive (10b) either, because it is A-movement, as assumed by Takahashi, and A-movement such as passive-movement cannot apply to P-Obj in the NPAC:

(13) a. The car was borrowed ***t*** from Mary. b. *Mary was borrowed the car from ***t***.

Furthermore, if we assume with Takahashi that English OS patterns with Icelandic OS, then it is already impossible for OS to derive (10b), since Icelandic OS cannot raise P-Obj in general:

(14) a. *Jón* *talaði* ***ekki*** [$_{PP}$ *við* [$_{NP}$ *Maríu*]].
John spoke not to Mary
'John didn't speak to Mary.'
b. **Jón* *talaði* [$_{NP}$ *Maríu*]$_1$ ***ekki*** [$_{PP}$ *við* ***t***$_1$] (Thráinsson 2001:151)

Accordingly, the availability of P-Obj remnants in the NPAC cannot be predicted by the identification of Move-R with HNPS or OS, revealing one limitation with the eclectic approach.

Turning to the problem of overgeneration, it involves the semantic types of nominals. The syntactic category of a nominal can semantically behave either as an individual (i.e., Arg-NP) or as a predicate proper (i.e., Pred-NP). For instance, the same NP (e.g., *a nurse*) can serve as the complement of the verb *date*, which takes an Arg-NP, or as the complement of the verb *become*, which can take a Pred-NP. The point is that Arg-NPs can be remnants, while Pred-NPs cannot, which is a fact noted by Baltin (2000). This difference is illustrated in (15).

(15) a. The students did not *date* doctors, but they did __ nurses. (Arg-NP)
b. *The students did not *become* doctors, but they did __ nurses. (Pred-NP)

We now argue that the eclectic approach fails to predict the unavailability of Pred-NP remnants. First, HNPS should be able to derive (15b), since it can apply to Pred-NPs as well as to Arg-NPs, as shown in (16). (16b is slightly degraded, but it is judged as grammatical.) Thus, the applicability of HNPS to Pred-NPs incorrectly predicts that Pred-NPs can be remnants.

(16) a. John has dated ***t***$_1$ recently [a more beautiful and more considerate nurse than anyone here]$_1$. (Arg-NP)
b. ?John has become ***t***$_1$ recently [a more skillful and more considerate nurse than anyone here]$_1$. (Pred-NP)

Second, there is reason to believe that OS should also be able to derive (15b). Pred-NPs must stay adjacent to their verbs in the same way as Arg-NPs, as shown in (17). Some researchers argue that such adjacency effects are reduced to the application of OS to verbs' complement NPs (e.g., Koizumi 1995). In other words, if an NP must be adjacent to its verb, the NP can and must undergo OS. If this correlation is correct, then OS should be able to pick Pred-NPs as remnants, which is contrary to the fact.

(17) a. John has (*recently*) dated (**recently*) a nurse (*recently*). (Arg-NP)
b. John has (*recently*) become (**recently*) a nurse (*recently*). (Pred-NP)

Accordingly, the unavailability of Pred-NP remnants cannot be predicted by identifying Move-R with HNPS or OS, uncovering another challenge to the eclectic approach.

In summary, we attempted to verify Takahashi's (2004) eclectic approach, which identifies Move-R with the combination of HNPS and OS. Our discussion involved three tests: (i) the availability of IO and DO remnants in the DOC, (ii) the availability of P-Obj remnants in the NPAC, and (iii) the unavailability of Pred-NP remnants. We showed that, although the eclectic approach predicts (i), it fails to capture (ii) and (iii). Thus, we claim that Move-R cannot be HNPS or OS.

2.2 Arguments for Johnson's (2008) QR Approach

Let us then verify Johnson's (2008) QR approach, which identifies Move-R with covert movement, namely QR. Setting aside for now the question of why QR can be overt in pseudo-gapping, we make two assumptions about the workings of QR in terms of Heim and Kratzer (1998). First, QR can only stop at the edge of syntactic nodes of type **t**, converting them into type **<e, t>** expression by adding λ-operators that bind traces of type **e** in their sister domains (i.e., *predicate abstraction*). Importantly, syntactic nodes of type **t** include VP under the VP-internal subject hypothesis, thus defining its edge as a landing site for QR. Second, QR can only apply to quantifiers, namely expressions of type **<<e, t>, t>** which denote sets of properties.[2] Note that the class of quantifiers may include proper names (e.g., *John*), definite descriptions (e.g., *the man*), indefinite plurals (e.g., *men*), depending on what type-shifting rules they undergo, as suggested by Partee (1987).[3] Under these assumptions, we take the QR approach to claim that potential expressions of type **<<e, t>, t>** can be picked as remnants, moving to the edge of VP, as shown in (18).

(18) a. QR
[she [does [$_{VP}$ **Tom** [λx. ~~[$_{VP}$ like ***t***]~~]]]]

b. Type-shifting the Remnant (before QR)
[[*Tom*]]: type **e** → type **<<e, t>, t>**
(N.B. [[α]] stands for 'the denotation of α')

We now make three new arguments for the QR approach. First, it captures the availability of IO and DO remnants in the DOC (see 5), because QR can apply to IO and DO, as well as Move-R can. For instance, as illustrated by Neeleman and van de Koot (2012), both IO and DO can outscope the subject, which we take to show that QR can affect IO and DO.

[2]Johnson (2008:73) simply assumes that QR applies to the syntactic categories of NP and PP; we depart from Johnson in this respect, adopting semantic restrictions on the application of QR as stated in the text.

[3]See Partee 1987:121 for the list of type-shifting rules, some of which convert expressions of type **e** or **<e, t>** to quantifiers (type **<<e, t>, t>**); e.g., [[*Bob*]] of type **e** = **b**, [[*Bob*]] of type **<<e, t>, t>** = λP. [P(**b**)].

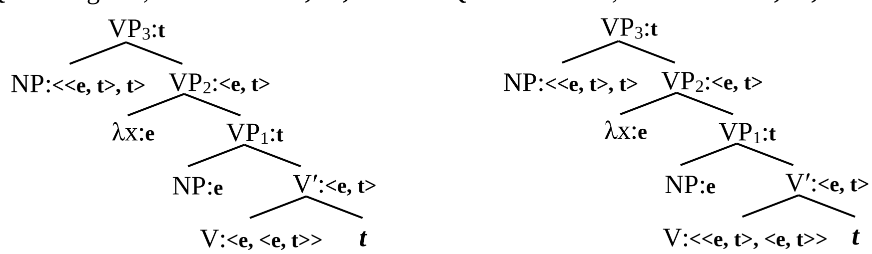
(19) a. [$_{SB}$ *Some teacher*] gave Mary [$_{DO}$ *every paper on the syllabus*]. ✓SB > DO, ✓DO > SB
b. [$_{SB}$ *Some teacher*] gave [$_{IO}$ *most students*] every paper on the syllabus. ✓SB > IO, ✓IO > SB
(Neeleman and van de Koot 2012:65–66)

Second, the QR approach predicts the availability of P-Obj remnants in the NPAC (see 10), because QR can apply to P-Obj in the NPAC in the same way Move-R can. This is illustrated in (20), where the P-Obj can outscope the object NP, showing that QR can affect P-Obj in the NPAC.

(20) John borrowed [*a type of car*] from [*every professor*]. ✓*a* > *every*, ✓*every* > *a*

Third, the QR approach explains the unavailability of Pred-NP remnants (see 15), because QR must apply to quantifiers but type-shifting a Pred-NP to a quantifier results in a type mismatch. Let us first consider the typed tree diagrams in (21); (21a) represents the QR of the complement NP of *date*, a verb of type **<e, <e, t>>**, while (21b) represents the QR of the complement NP of *become*, a verb of type **<<e, t>, <e, t>>**. The point is how to interpret the trace left behind by QR.

(21) a. QR of Arg-NP, shifted to **<<e, t>, t>** b. QR of Pred-NP, shifted to **<<e, t>, t>**



For the sake of discussion, suppose that traces can be turned into variables of type **e** or type **<e, t>**. Then, in (21a), there is a way to semantically combine V and the trace; it is to analyze the latter as a variable of type **e**. In (21b), however, there is no way to combine them. First, if the trace is analyzed as a variable of type **e**, it is not an argument to V, thus inducing a type mismatch. Second, if the trace is analyzed as a variable of type **<e, t>**, it can be an argument to V, but combining them ends up with the λ-operator binding no variable of type **e**, thus rendering the node of VP_2 uninterpretable. This means that the QR approach reduces the unavailability of Pred-NP remnants to the compositional impossibility of type-shifting Pred-NPs to quantifiers. Note that this account makes the prediction that no genuine quantifier (e.g., *every NP*) can appear as the complement NP of a verb of type **<<e, t>, <e, t>>**. This is the case, as shown by the ungrammaticality of (22b).

(22) a. *A student* dated *every nurse*. ✓*a* > *every*, ✓*every* > *a*
b.**A student* became *every nurse*.

In summary, we verified a modified version of Johnson's (2008) QR approach, which identifies Move-R with QR. Our discussion involved the same testing grounds as before: (i) the availability of IO and DO remnants in the DOC, (ii) the availability of P-Obj remnants in the NPAC, and (iii) the unavailability of Pred-NP remnants. We showed that the QR approach predicts all of (i), (ii), and (iii). Thus, we conclude that the QR approach is empirically superior to Takahashi's (2004) eclectic approach, suggesting that QR is a better candidate for the identity of Move-R.

2.3 Confirmation: The General Validity of the QR Approach

Given the above conclusion, we then argue for the general validity of the QR approach. More specifically, we show that there are further observations compatible with identifying Move-R with QR than described in the previous subsection. In the following, we illustrate three more correlations between QR and Move-R. They are found in (iv) the boundedness of movement length, (v) the inability to license parasitic gaps (*pg*), and (vi) the inapplicability to particles.

The first correlation lies in the boundedness of movement length. That is, QR and Move-R can proceed out of subject-control infinitive clauses (e.g., Baltin 2000, Johnson 2008), as shown in

(23); QR can allow the embedded object to outscope the matrix subject, while Move-R can raise the embedded object into the matrix clause. However, this is not the case with finite clauses (Johnson 2008), as shown in (24); QR and Move-R cannot proceed out of them.

(23) a. *A different instructor* might want to read *every book.* ✓*a* > *every*, ✓*every* > *a*
b. Will might *want to eat* kale, but he won't __ asparagus.
(24) a. *A different instructor* might decide that Carrie should read *every book*.
✓*a* > *every*, **every* > *a*
b. *Will might *decide that Carrie should eat* kale, but he won't __ asparagus.
(Johnson 2008:71)

The second correlation lies in the inability to license *pg*. As Kim and Lyle (1996) point out, QR cannot license *pg*, which is illustrated in (25b). If Move-R is identified with QR, then the former also should not be able to license *pg*. This prediction is borne out by the ungrammaticality of (26b), which is adapted from Baltin 2003: 241.[4]

(25) a. *No article* did John ever file without reading *pg*.
b. *John filed *no article* without reading *pg*. (Kim and Lyle 1996:292)
(26) a. ?Although John didn't kiss Mary, he did__ Sally without looking at her.
b. *Although John didn't kiss Mary, he did __ Sally without looking at *pg*.

The third correlation lies in the inapplicability to particles. As shown in (27b), the particle *down* cannot be a remnant (e.g., Baltin 2000). This suggests that Move-R must apply to NPs, which are potential expressions of type **<<e, t>, t>** and thus appropriate input to QR, and that Move-R and QR can move an entire PP by pied-piping, the possibility exemplified by (27a).

(27) a. Although I wouldn't *send it* up the stairs, I would __ down the fire escape.
b. *Although I wouldn't *send it* up, I would __ down. (Baltin 2000:18–19)

In summary, we argued that the QR approach can capture three more properties of Move-R: (iv) the boundedness of movement length, (v) the inability to license *pg*, and (vi) the inapplicability to particles. One might claim that these facts are not direct evidence for the QR approach, because most of them seem to be captured under Takahashi's (2004) eclectic approach. However, the point that we are making here is that the observations above are not against the QR approach, but rather consistent with it. Thus, they are suggestive as long as the validity of the QR approach is supported by our findings, namely (ii) the availability of P-Obj remnants in the NPAC, and (iii) the unavailability of Pred-NP remnants, which the eclectic approach cannot predict.

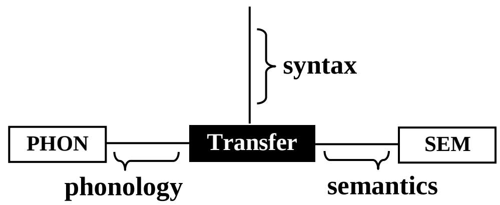
3 Extension: Towards a New Phonological Theory of QR

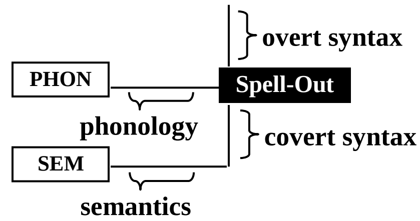
We now consider a theoretical question that must be answered in order to justify the QR approach. That is, why can QR be overt in pseudo-gapping? As an answer to this question, we make a proposal within the *single output model of syntax* (e.g., Bobaljik 1995), where there is one syntactic component with no overt/covert distinction and "covert" movements result from pronunciation targeting the tail of a chain. This model is thus different from the traditional T model of grammar, or the *dual output model of syntax* (e.g., Chomsky and Lasnik 1977), which posits two sorts of syntactic cycles and defines "covert" movements as ones occurring after Spell-Out. In the following, we adopt the model in (28a) and propose a new form of the phonological theory of QR.

[4]Takahashi (2004) argues for the ability of Move-R to license *pg*, based on the grammaticality of (i), cited from p.561, where the *pg* is licensed by the remnant NP to its right. He claims that (i) is derived by HNPS, which he assumes can license *pg*. However, it is a controversial assumption. For instance, Postal (1994) suggests that similar configurations be derived by *right node raising*. We leave the nature of (i) for future study.

(i) Although John didn't *give the boy* a short paper, he did __ [without reading *pg*] [a long paper].

(28) a. *Singe Output Model of Syntax* b. *Dual Output Model of Syntax*





Let us begin by setting the empirical stage for our proposal. First of all, there is an interpretive restriction on remnants in pseudo-gapping, as noted by Lasnik (1995). The restriction can be stated as follows: remnants must be "contrasted" with their correlates. For example, the remnant in (29b) is acceptable as part of the answer to (29a), but not that in (29c).

(29) a. Speaker A: Is she suing *the hospital*?
b. Speaker B: She is _ *the doctor*. (a, b from Halliday and Hasan 1973:49)
c. Speaker B: *Yes, she is _ *the hospital*. (c from Lasnik 1995:145)

In (29b), the remnant denotes a different individual than the correlate does (i.e., *the doctor* vs. *the hospital*), whereas in (29c) the remnant refers to the same individual as the correlate does (i.e., *the hospital*), for which case it appears that the remnant is not "contrasted" with the correlate. Thus, in order to capture the difference between (29b) and (29c), we assume that the remnant must be interpreted as a *contrastive focus*, in the following sense (cf. Rooth 1992).

(30) Every constituent α counts as a contrastive focus iff there is β such that (for any model):
a. $[[\beta]] \in C$ '[[β]] is a member of *C*, the set of contextually given elements'
b. $[[\beta]] \neq [[\alpha]]$ '[[β]] and [[α]] are not identical'
c. $[[\alpha\text{'s sister}]] \subseteq [[\beta\text{'s sister}]]$ '[[α's sister]] is a subset of [[β's sister]]'

To demonstrate how (30) works, suppose that the VP structures in (29) are those shown in (31). In the case of (29b), the remnant (i.e., *the doctor*) is properly interpreted as a contrastive focus, since the correlate (i.e., *the hospital*) can be counted as β in (30), meeting the conditions in (30a-c); it is contextually given, semantically non-identical with the remnant, and its sister δ semantically includes the remnant's sister γ as a subset.[5]

(31) a. [she [sue$^{\delta}$ *the hospital*]] : Correlate's sister = δ < [[δ]] = λy.λx. [**sue**(y)(x)] >
b. [<u>*the doctor*</u> [$^{\gamma}$ λx. [she sue x]]] : Remnant's sister = γ < [[γ]] = λx. [**sue**(*she*)(x)] >
c. [<u>*the hospital*</u> [$^{\gamma}$ λx. [she sue x]]] : Remnant's sister = γ < [[γ]] = λx. [**sue**(*she*)(x)] >

In the case of (29c), on the other hand, the remnant (i.e., *the hospital*) cannot be interpreted as a contrastive focus. This is because (at least within the exchange in 29a and 29c) there is no β that meets all the conditions in (30a-c). For instance, the correlate cannot be counted as such, since it is identical with the remnant, thus violating (30b). If remnants must be interpreted in this way, then we can also expect that there is a phonological restriction on remnants. According to Rooth (1992), a contrastively focused constituent contains phonological stress. Given this, it should follow that remnants must contain phonological stress. As demonstrated by Hoeskema (2006), this is the case; unstressed remnants are unacceptable. Consider the contrast in (32), where capital letters indicate stressed elements. Thus, as a summary of the survey so far, we hold the generalization in (33).

(32) a. Maybe they fool YOU, but they certainly don't ME.
b. *Maybe they FOOL you, but they certainly DON'T me. (Hoeskema 2006:9)

(33) *Focus-Stress Restriction on Pseudo-gapping Remnants*
Remnants must be contrastively focused; as a result, they must be phonologically stressed.

[5]Set-theoretically, [[δ]] is {<y, x>: y sues x} (i.e., the set of pairs <x, y> such that y sues x) and [[γ]] is {<*she*, x>: *she* sues x}; with the value of the pronoun *she* fixed e.g., as *Mary*, [[γ]] is a subset of [[δ]].

Given this, let us now show a new phonological theory of QR. We begin by making three assumptions. (A) The syntax-phonology mapping includes the operation *Delete α*, which makes syntactic constituents phonologically empty. (B) The input to Delete α is marked by rules or algorithms. For example, we assume an optional rule that marks VP as input to Delete α; call this rule *VP-deletion*. (C) Delete α is also used to reduce a chain, a discontinuous unit of copies of a moved element. Specifically, we assume that there are some rules that mark a chain as input to Delete α in order to pick only one member of it for pronunciation by eliding all other members; call this type of rule *CH-deletion*. Under these assumptions, we propose a CH-deletion rule for "covert" movement as stated in (34), and also that for "overt" movement as stated in (35); the two rules differ in which of the highest copy and the lowest copy is preserved in the application of Delete α.

(34) *CH-deletion for "Covert" Movement (e.g., QR in English)*
For the chain of copies of γ,
a. If γ is focused, mark every copy of γ but the **lowest** *accessible* one as input to Delete α;
b. otherwise, mark every copy of γ but the **lowest** one as input to Delete α.

(35) *CH-deletion for "Overt" Movement (e.g., wh-movement in English)*
For the chain of copies of γ,
a. If γ is focused, mark every copy of γ but the **highest** *accessible* one as input to Delete α;
b. otherwise, mark every copy of γ but the **highest** one as input to Delete α

Focusing on (34), note that it is focus-sensitive; when the moved element γ is focused, the (a) instruction is selected in order not to mark the lowest *accessible* copy of γ as input to Delete α; the definition of accessibility is given in (36). This means that (34) can interact with other deletion rules, such as VP-deletion, so that a copy of the focused γ can be preserved for pronunciation.

(36) For every deletion rule δ, and for every constituent γ,
γ is *accessible* to δ if γ is not marked as part of input to Delete α in any other rule than δ.

We now demonstrate that our phonological theory of QR allows QR to be overt in pseudogapping. Suppose that QR of a constituent γ has derived the structure in (37), where γ^1, γ^2, and γ^3 are members of the chain created by QR. Then, the CH-deletion rule in (34) can make four instructions on which constituents are marked as input to Delete α, according to whether the VP-deletion rule is applied or not, and whether γ is focused or not. The four instructions are schematized in (38), where the boxed materials indicate those marked as input to Delete α.

(37) $[\ \gamma^3\ [\ \ldots [\ \gamma^2\ [_{VP} \ldots \gamma^1 \ldots]]]]$

(38) a. *Where the VP-deletion rule is not applied*: $[\ \gamma^3\ [\ \ldots [\ \gamma^2\ [_{VP} \ldots \gamma^1 \ldots]]]]$
i. If γ is not focused, the inputs to Delete α are: $[\ \boxed{\gamma^3}\ [\ \ldots [\ \boxed{\gamma^2}\ [_{VP} \ldots \underline{\gamma^1} \ldots]]]]$
ii. If γ is focused, the inputs to Delete α are: $[\ \boxed{\boldsymbol{\gamma^3}}\ [\ \ldots [\ \boxed{\boldsymbol{\gamma^2}}\ [_{VP} \ldots \underline{\boldsymbol{\gamma^1}} \ldots]]]]$
b. *Where the VP-deletion rule is applied*: $[\ \gamma^3\ [\ \ldots [\ \gamma^2\ \boxed{[_{VP} \ldots \gamma^1 \ldots]}]]]$
iii. If γ is not focused, the inputs to Delete α are: $[\ \boxed{\gamma^3}\ [\ \ldots [\ \boxed{\gamma^2}\ \boxed{[_{VP} \ldots \gamma^1 \ldots]}]]]$
iv. If γ is focused, the inputs to Delete α are: $[\ \boxed{\boldsymbol{\gamma^3}}\ [\ \ldots [\ \underline{\boldsymbol{\gamma^2}}\ \boxed{[_{VP} \ldots \boldsymbol{\gamma^1} \ldots]}]]]$

Under the condition in (38a), where nothing is marked as input to Delete α, (34a) and (34b) result in the same input to Delete α. This is because the lowest *accessible* copy of γ and the lowest copy of γ are the same: i.e., γ^1. Thus, the cases of (i) and (ii) both instruct Delete α to elide γ^3 and γ^2, leaving γ^1 for pronunciation, and represent general cases of QR where its output is covert. Under the condition in (38b), however, (34a) and (34b) make different instructions, given that the VP is marked as input to Delete α. In the case of (iii), where γ is not focused, γ^3 and γ^2 are marked as input to Delete α, because (34b) requires marking every copy of γ except the lowest one as such. This means that Delete α applies to γ^3, γ^2 and the VP, which contains γ^1. Turning to the case of (iv), where γ is focused, (34a) does not allow us to mark γ^2 as input to Delete α, because γ^2 is the lowest *accessible* copy of γ. Note that, under the definition in (36), γ^1 is not counted as an *accessible* copy to the CH-deletion rule, because it is marked as part of the input to Delete α in the VP-deletion rule. Thus, the case of (iv) instructs Delete α to elide only γ^3 and the VP, leaving γ^2 for pronunciation. Importantly, the case of (iv) is what we want. That is, it is an adequate representation of the pseudo-gapping construction, where the VP is elided, a VP-internal element (i.e., the remnant) surfaces, and that element is focused. Accordingly, our phonological theory of QR can justify the QR approach; it is theoretically possible for QR to be overt in pseudo-gapping.

At this point, one clarification is needed about the landing sites for QR. In order to limit the surface position of the remnant to the edge of the elided VP, we must require QR to leave a copy of the remnant there, as in (38iv), without going in one fell swoop to a higher node of type **t** (e.g., a TP node); otherwise, we have no copy to be pronounced at the VP edge. This requirement, we assume, is derived from the principle of *Shortest Move* (Fox 1998:26): QR must move a quantifier γ to the type **t** node closest to γ. This principle ensures that, if QR moves γ out of the VP closest to γ, it must target the edge of that VP first, since the highest projection of any VP is of type **t**. Given this, it follows that the remnant surfaces in no other positions than the edge of the elided VP, as illustrated in (39).[6] This is because QR must leave a copy of the remnant at the left edge of the VP, and even if it creates another copy in a higher position, as shown in (40), the lower copy at the VP edge, which is the lowest *accessible* copy, is preserved for pronunciation.[7] Thus, our theory of QR presupposes such a principle as Shortest Move, which determines the landing sites for QR.

(39) Although John may like onion, (#*carrot*) he (**carrot*) may (**carrot*) not (*carrot*).
(40) [(***Obj***) (…) [not [***Obj*** [$_{VP}$ like ***Obj***]]]] (=an example of 38iv)

Finally, let us close this section by considering two predictions based on (38). First, (38iii) predicts that covert QR of a non-focused object should be possible out of an elided VP. This prediction is upheld by the example in (41), which is from Fox (1998). In the second clause, the negative element *not* can be outscoped by the object *more than 3 languages*, which is elided by VP-deletion.[8] This means that QR can covertly move the object elided by VP-deletion and create a copy of it above *not*, as in (42), allowing that copy to be selected for interpretation.

(41) Ken Hale doesn't speak more than 3 languages. Rob Pensalfini doesn't __ as well.
second clause: ✓*not* > *more than 3*, ✓*more than 3* > *not* (Fox 1998:46)
(42) [*Obj* (…) [does***n't*** [*Obj* [$_{VP}$ speak *Obj*]]]] (=an example of 38iii)

Second, (38i)/(38ii) predict that overt QR of an object should be impossible without VP-deletion, regardless of whether the object is focused or not; in other words, no object can appear to the left of its verb in English. This is the case, as illustrated in (43b). Under our analysis, if QR moves the object to the VP edge (and then to a higher node), as in (44), a copy at its base position, which is the lowest (*accessible*) copy, is preserved for pronunciation. Note that this self-evident prediction is important in showing that our theory can capture the absence of overt scrambling in English.

(43) a. Mary hasn't dated Bill, but she has Harry ~~[$_{VP}$ dated ***t***]~~.
b. *She has Harry dated. (Lasnik 1999:147)
(44) [(*Obj*) (…) [has [*Obj* [$_{VP}$ dated *Obj*]]]] (=an example of 38i/38ii)

4 Conclusion: An Implication for the Model of Syntax

In summary, this paper made a new argument for Johnson's (2008) claim that Move-R in pseudo-gapping is an overt case of QR, and proposed a new phonological theory of QR that clarifies when it can be overt. If our characterization of QR is correct, then it makes an argument against the dual output model of syntax (e.g., Chomsky and Lasnik 1977), which defines QR as a post-Spell-Out

[6]The leftmost instance of the remnant in (39) is grammatical, but requires setting a special context in order to be acceptable (hence marked #), suggesting that it is not a result of QR, but a result of topicalization.

[7]QR in pseudo-gapping should be a leftward movement, targeting the left edge of XP. For instance, it can apply to P-Obj, as in (10) and (11), which is not the case with a rightward movement such as HNPS.

[8]I would like to thank Kyle Johnson (p.c) for pointing out the possibility of covert QR out of an elided VP as in (41), which he suggests should be captured under any form of the phonological theory of QR.

operation. That is, it is unclear how that model can accommodate the possibility of overt QR; it is unclear how it can feed the output of a post-Spell-Out operation to the phonological component. Thus, in light of the possibility of overt QR, the single output model of syntax (e.g., Bobaljik 1995), in which our theory of QR consists, is closer to the truth than the dual output model is.

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