Prolific peripheries. A radical view from the left

By Kleanthes K. Grohmann
Reviewed by Sergio Menuzzi

Summary by the author

1. Overview

One of the major results of research in generative grammar is the development of the concept of locality, the condition that movement dependencies underlie an upper bound on distance. What this dissertation pursues is the reverse question, namely whether there is also a lower bound on locality. In other words: Is there a minimum distance that objects in the phrase-marker have to move? In the course of this investigation, we see that it actually makes sense to speak of such *anti-locality*—particularly in a minimalist framework, one that aims at getting rid of redundancies in the grammar, superfluous stipulations, and basically any rule, filter, constraint, condition or operation that does not follow from bare output conditions. The formulation of anti-locality considered here leads us to a formal *tripartition of clause structure*, in order to yield a metric with which we can compute this minimum distance, locally and unambiguously. The goal of this dissertation is then to construct a framework that allows implementing the concept of anti-locality (chapter 2), motivating this framework and integrating it into the larger minimalist pursuit (chapters 2 and 3), supporting the ideas empirically (chapters 3 and 4), and consider wider consequences of the approach (chapters 5 and 6). In this brief summary, I can only sketch the main theoretical and empirical issues pertaining to the framework of anti-locality.

2. Anti-locality in movement dependencies

The conceptual starting point of the current investigation lies in cases such as (1)–(3), and many analogous ones (relevant structures simplified). Standard conceptions of locality (such as Shortest Move, Minimal Distance or Attract Closest, viz. the different versions contained in Chomsky 1995) have no bearing on the potential movements illustrated in the b-examples; these all involve movement of a maximal phrase to (roughly) the next highest specifier position. However, all such cases lead to ungrammaticality.

(1) a. * John likes. (cf. John likes himself.)
b. # [$_{vP}$ John *v* [$_{VP}$ likes-V ~~John~~]]
(2) a. * Den Vater mag sein Sohn.
the.ACC father likes his.NOM son
intended: 'The father likes his son.'
b. # [$_{TP}$ den Vater [mag-T [$_{AgrOP}$ ~~den Vater~~ AgrO [$_{vP}$ … ~~den Vater~~ …]]]]
(3) a. * Who, John saw?
b. # [$_{TopP}$ who Top [$_{FocP}$ ~~who~~ Foc [$_{TP}$ John saw ~~who~~]]]

The question why the relevant movement steps sketched above are ruled out does not arise in standard GB-analyses. Thus, (1) constitutes a violation of the Theta Criterion, (2) can be explained by the Case Filter, and (3) could be understood as a violation of the Wh- and/or Topic Criterion. In this sense, asking whether too local movement sketched in the structures above should be barred is meaningless.

However, (1)–(3) can also be described more generally: they all involve a potential movement step from one position to another within a specific part of the clause. Thus, (1) involves two thematic positions, (2) two Case or agreement positions, and (3) two discourse-related positions. This allows a first stab at the clausal tripartition mentioned above (which is also hinted at in Rizzi 1997, for example, or, more explicitly, in Platzack 2001). Let us call each such part a *Prolific Domain*–''domain,'' because it involves similar context (see below) and ''prolific,'' because each such domain contains a number of projections (VP, *v*P, AgrP, TP, TopP, CP etc.). We can thus speak of the *θ-domain* (the part of the derivation where theta relations are created), the *ϕ-domain* (the part of the derivation where agreement properties are licensed),

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and the *ω-domain* (the part of the derivation where discourse information is established). The working hypothesis for Prolific Domains as formalized subparts of the clause can be formulated as follows:

(4) PROLIFIC DOMAIN
A Prolific Domain ΠΔ is a contextually defined part of the computational system
i. which provides the interfaces with the information relevant to the context and
ii. which consists of internal structure, interacting with derivational operations.

Such an understanding of clause structure allows for a dynamic conception of the computation. As especially (4i) indicates, this is very much in line with recent work on multiple Spell Out (Uriagereka 1999, Chomsky 2000), where the LF-and PF-interfaces are fed cyclically as the derivation unfolds. (While pursued throughout the dissertation, some specific consequences are discussed in chapter 6, including a comparison with the phase-driven framework of Chomsky 2000, 2001a, 2001b.) The contextual definition of Prolific Domains is encoded lexically on each head (V, T, C etc.) through a context variable (θ, ϕ, ω).

3. Domain exclusivity

Let us now turn to capturing anti-locality. I propose to express the ban on movement within a Prolific Domain with the **Condition on Domain Exclusivity (CDE)**:

(5) CONDITION ON DOMAIN EXCLUSIVITY (CDE)
An object O in a phrase marker must have an exclusive Address Identification AI per Prolific Domain ΠΔ, unless duplicity yields a drastic effect on the output.
i. An AI of O in a given ΠΔ is an occurrence of O in that ΠΔ at LF.
ii. A drastic effect on the output is a different realization of O at PF.

We can think of AI as interpretive visibility, i.e. its LF-presence (per (5i)) coupled with a unique PF-matrix (as (5ii) suggests). Thus the restriction is that a given object in the phrase marker can only have one and the same phonological occurrence, pronounced or not, in a particular Prolific Domain. In other words, anti-locality is a PF-condition and as such follows from bare output conditions. (5i) rules out the illicit derivational steps in (1)–(3): movement within a Prolific Domain would create two non-distinct copies of the moved element with the same PF-matrix and hence result in a PF-violation. Note that evaluation of a potential PF-violation is extremely local: the CDE kicks in right after movement takes place, as Prolific Domains are unambiguously established through the context variable. Following the work of Nunes (1995, 1999, 2001), we understand deletion of non-distinct copies to be driven by PF-requirements also (for linearization purposes). Deletion of the lower copy can obviously not satisfy the ''drastic effect on the output'' requirement (otherwise, (1)–(3) should be fine)—but, as I suggest, spelling out the lower copy with a different PF-matrix can.

In the remainder of this summary, I want to concentrate on (5ii). It basically suggests that a domain-internal movement step should be legitimate, just in case the lower copy does not get deleted, but spelled out with a different phonological matrix—that is, *Copy Spell Out* may legitimize domain-internal movement. What may seem as an ad hoc repair strategy is actually a very natural consequence of a particular view of certain pronominal entities that has its root in early transformational work, such as Lees & Klima (1963). This line of reasoning has recently been picked up by Hornstein (2000), for example (see also Aoun & Benmamoun 1998, Aoun & Choueiri 2000, Aoun, Choueiri & Hornstein 2001, and, with different sets of assumptions, Lidz & Idsardi 1998, Zwart 2002, Kayne 2002). The strict locality conditions holding on many pronominal licensing environments (as in Binding Theory Condition A, but also beyond) have led to various attempts to derive the placement of many pronominal elements from movement. Hornstein (1999, 2000) argues for the elimination of all rules of construal (control, Binding Theory, secondary predication and so on), and reinterprets the observable outcomes in terms of movement. This view takes certain pronominal elements to be grammatical formatives, not lexically inserted items, but repair elements, introduced into the derivation as a last resort strategy.

Such a view allows us to make sense out of the CDE. Domain-internal movement is not prohibited because the movement step itself is illegitimate, but because the output is illegible at the interfaces. If we could now find motivation for a domain-internal movement, two choices would open up: this movement step must be ruled out at all costs (requiring a reinterpretation of the motivation to move) or the illicit movement must be rescued.

4. Copy spell out

Integrating proposals that view thematic roles essentially as movement-motivating features (Bošković 1994) and certain pronominal elements as derivationally introduced grammatical formatives (Hornstein 2000), the empirical basis of the dissertation considers potential XP-pronoun constructions which have all the properties of movement, yet display prima facie CDE-violations, or anti-locality effects. The basic line of reasoning runs as follows: if an XP and a coreferent pronoun are in a local relationship to each other, the pronoun is not a lexical element, but a grammatical formative, a spelled out copy of the moved XP.

Obvious realms of application are constructions in which a pronominal element picks up the reference of an ''antecedent'', be it driven by thematic, agreement

or discourse properties. *Local anaphors* seem to fit in the first category: the anaphoric relationship between pronoun and antecedent is thematically governed; both elements bear a θ-role.

The relevant derivational steps for local anaphors do thus take part in the θ-domain and can be sketched as follows, where '➲' indicates Copy Spell Out and strikethrough a lower copy:

(6) a. [$_{vP}$ *Agent* v [$_{VP}$ ~~*Theme*~~ ➲ ANAPHOR V Patient]]
b. [$_{vP}$ *Agent* v [$_{VP}$ Theme V ~~*Patient*~~ ➲ ANAPHOR]]
c. [$_{vP}$ Agent v [$_{VP}$ *Theme* V ~~*Patient*~~ ➲ ANAPHOR]]

Among the structures (6) takes care of are local reflexives, as in the following. (More instances, including reflexive ECM-subjects, double object constructions, and local reciprocals are discussed in chapter 3.)

(7) a. [$_{vP}$ John introduced-v [$_{VP}$ ~~John~~ ➲ himself ~~introduced~~ to Mary]]
b. [$_{vP}$ John introduced-v [$_{VP}$ Mary ~~introduced~~ to ~~John~~ ➲ himself]]
c. [$_{vP}$ John introduced-v [$_{VP}$ Mary ~~introduced~~ to ~~Mary~~ ➲ herself]]

Another relevant type of construction is *left dislocation*, in particular contrastive left dislocation (CLD) as found in many Germanic languages (see e.g. the collection of papers in Anagnostopoulou et al. 1997 for discussion, old and new). Here we can observe on the one hand a movement relation between a CLDed XP and its original thematic position (connectivity effects, Case-marking etc.), and on the other a tight relationship between that XP and a (resumptive) pronoun. (8) shows a relevant paradigm:

(8) a. [*This man*], I don't know *him*. [English HTLD]
b. [*Diesen Mann*], *den* kenne
this.ACC man that-one.ACC know
ich nicht. [German CLD]
I not
'This man, I don't know [him].'
c. [*Afton ton andra*], dhen *ton*
this.ACC the.ACC man.ACC not 'm.ACC
ksero. [Greek CLLD]
know.1SG
'This man, I don't know ['em].'

(8a) is a hanging topic construction (the only variant found in English; HTLD exists in other languages also); HTLD should not be analysed in terms of movement and Copy Spell Out, as it does not exhibit any of the movement diagnostics that CLD displays. (8b) is an example of a typical CLD construction from German. (8c), finally, is an instance of clitic left dislocation (CLLD) from Greek (also found in many Romance languages and Arabic, for example). CLD and CLLD are very similar in many respects, but differ in others.

Relevant for current purposes is that CLD invariably involves the ω-domain, while the resumptive (clitic) in CLLD arguably comes to existence inside the ϕ-domain. The idea is to link the XP-resumptive relation to Copy Spell Out, as a way to satisfy the CDE. Thus CLD involves spelling out the XP-copy in a topic position (ω-domain), while CLLD utilizes an AgrP (ϕ-domain). (On other instances of resumption in a minimalist setting, the ''true resumptives'' in the sense of Sells 1983, see Boeckx 2001.) Taken together with instances of local anaphors, we now have three types of Copy Spell Out, one in each Prolific Domain. This state of affairs can be generalized as in (9c) below, where the '$\alpha\Delta$' denotes one particular Prolific Domain.

5. Some extensions and consequences

The CDE as laid out here makes particular reference to maximal phrases, as opposed to heads. This follows from the assumption that head movement serves to create a new PF-matrix by definition, enriching a given head with more morphological material (whether actually pronounced or not). If on the right track, we face the following typology of (dis)allowed XP-movements:

(9) a. # [$_{\alpha\Delta}$ XP … ~~XP~~ …]
b. [$_{\beta\Delta}$ XP … [$_{\alpha\Delta}$ … ~~XP~~ …]]
c. [$_{\alpha\Delta}$ XP … ~~XP~~ ➲ PRONOUN …]

This leads us to consider some consequences of the current framework. For one, integrating the Bošković-Hornstein approach has some interesting implications for inter- vs. intra-clausal movement. The generalization is that movement within a clause must proceed from one to the next higher Prolific Domain (from θ- to ϕ- to ω-domain), whereas movement across a clause boundary targets a position within the next highest Prolific Domain of the same type (θ-to-θ-,ϕ-to-ϕ- and ω-to-ω-movement, as in e.g., standard control, raising and successive-cyclic Wh-movement constructions, respectively).

Among the topics that cannot be treated here is an in-depth discussion on phrase structure, essentially arguing against the possibility of multiple specifiers on conceptual, theoretical, and empirical grounds. This is also important to answer the question how the clausal tripartition into Prolific Domains fares compared to the bipartition into ''phases'' (Chomsky 2000, 2001a, 2001b); it also begs the question whether we can find Prolific Domains in other areas. Another chapter that cannot be discussed here deals with multiple Wh-question formation across languages and the relevance that the framework of anti-locality bears on some of the issues.

In sum, this dissertation opens up the question whether movement must pass a minimum distance. It argues that it does and offers a framework that allows us to capture this requirement in terms of anti-locality. By doing so, many further questions arise, some of which are treated in depth, while others could only be touched upon.

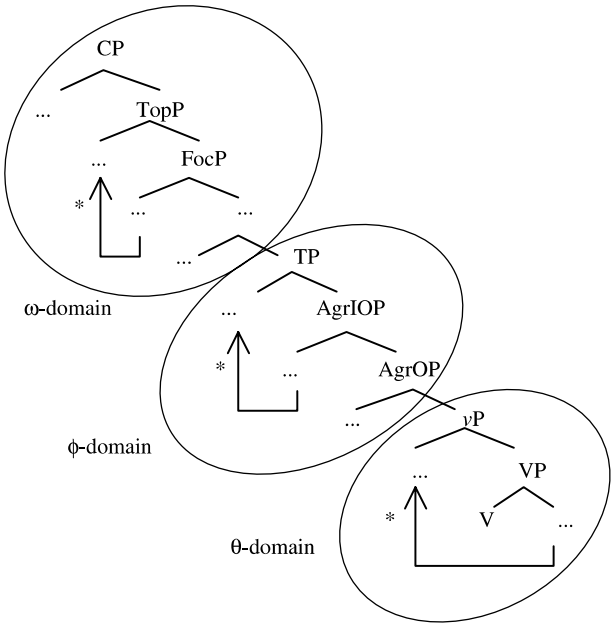
Review by Sergio Menuzzi

1. The cyclic feeding of interfaces

Grohmann's dissertation contains many ingredients to attract the syntactic audience, some already presented in his summary. One is the surprising idea that, besides locality constraints, movement would be subject to an anti-locality restriction. Another one is his contribution to the program of reducing construal to movement, building up on the recent *tour de force* by Hornstein (1999, 2000). Descriptively oriented readers will find an interesting discussion about left dislocation structures and multiple interrogatives in German, as well as a detailed comparison with related structures in other languages (including Dutch, Modern Greek, Bulgarian, Serbo-Croatian, Japanese). In this review, I would like to concentrate on certain aspects of Grohmann's work related to what seems to me to be his main insight: the hypothesis of *the cyclic feeding of interfaces*.

As stressed in his summary, Grohmann's point of departure is the non-existence of three types of derivations, represented in his (1b), (2b) and (3b) above. All those derivations would be excluded by independent conditions in GB analyses, but what he asks himself is whether they would not form a larger generalization. His answer is that they do. For him, they have to do with the clause structure and its partition in the three ''*prolific domains*'' shown in (10) below: there would be a constraint excluding movement precisely within these domains – hence, the anti-locality effect (the numbering of figures and examples below follows up Grohmann's summary's):

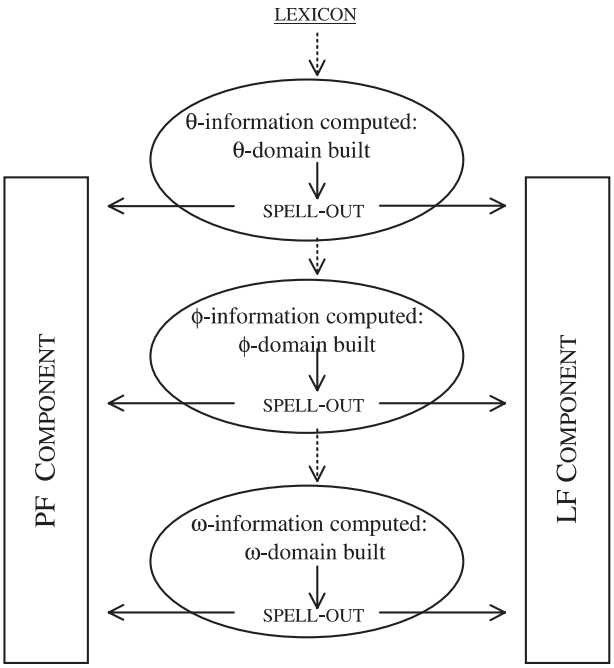
(10)



The structure in (10) is currently widespread, especially in work adopting the ''cartographic approach'' to clause structure (cf. Rizzi 1997, 2001, Cinque 1999). And it has been noticed, too, that the three topological areas shown in (10) should be characterized in terms of the ''same sort of information''. What is new in Grohmann's proposal is the reason why this should be so. The idea he develops, mainly in his chapter 6, amplifies recent proposals about cyclic Spell-Out (Uriagereka 1999, Chomsky 2000). In a nutshell, it is this: each domain in (10) results from a *derivational cycle* in clause building.

For Grohmann, what defines a derivational cycle is the syntactic computation of some *specific type of information* relevant to the interfaces, PF and LF. These are conceived not as levels, but as information-processing components. A cycle begins by the computational system selecting from the lexical array the elements carrying some specific information. The first to be computed is *θ-information*. The cycle closes when the relevant pieces of computed information are sent by Spell-Out to the interface components. Subsequent cycles apply to the elements carrying *ϕ-* and *ω-information*, respectively. The resulting model of grammar looks like the following (adapted from Grohmann's figure (7), p. 291):

(11)



Note that in minimalist terms, computing means merging, copying and checking features and feature bundles – that is, *building up phrase structure*. Crucially, for Grohmann this process cyclically accesses specific types of features and feature bundles, related to specific types of relations – thematic, agreement and discourse relations. This explains quite naturally why the clause would be organized in *functionally defined topological areas*, as (10) above. That is, a substantive aspect of the clause structure as proposed by recent ''cartographic'' analyses would be deduced under the above conception of the cycle.

Grohmann's explanation for the *anti-locality* effects on movement is also intimately related to the model in (11). As described in his summary, he proposes these effects follow from a new legibility condition on PF, the *Condition on Domain Exclusivity* [*CDE*, (5) above]: a syntactic constituent must have an exclusive address identification in each prolific domain, unless it triggers a drastic effect on the PF output. The requirement for a unique ''address identification'' blocks movement within a prolific domain whenever two non-distinct copies are spelled out, as in **John likes John*. The ''unless'' clause does allow for such movement, but only when one of the copies suffers a ''drastic effect at PF''. As Grohmann explains, this ''drastic effect'' cannot be deletion, however, or the ungrammatical derivations in (1b), (2b) and (3b) above would be OK. Rather, one of the copies must be spelled out by a ''different PF-matrix'' – by an appropriate *pronominal form*, as in his examples in (7). (That the lower copy is the one to get spelled out follows from economy considerations, as in the analysis of the non-realization of traces by Nunes 1995, 2001.)

The CDE fits well in (11) in at least two senses. First, since prolific domains are the result of the cyclic feeding of the interfaces, and the CDE is conceived as an interface constraint, the domains in which it operates follow nicely. Moreover, as we have seen, the cyclic feeding of the interfaces is ''functionally defined'' – each cycle provides the interfaces with an input corresponding to a specific set of relations and functions. It makes sense, therefore, that the interface components check each such input for a non-ambiguous matching between ''objects'' and ''functions''. Conceivably, such non-ambiguous matching might be disturbed if an object were not clearly ''visible'', where ''visibility'' would be a biunique relation between ''functional role'' – an occurrence at LF – and ''signal'' – a different PF-matrix.

Conceptually, then, Grohmann's main theoretical proposals form a coherent picture: clause structure and the cyclic nature of the derivation are intimately related, and the CDE seems a natural constraint to impose on the derivational outputs of the model. Let me turn now to some of the empirical discussion in Grohmann's dissertation.

2. Arguments for the CDE

Grohmann pursues two main lines of empirical argumentation. On the one hand, he tries to establish the correctness of the CDE and of the anti-locality effect, searching for instances of this effect in the three prolific domains identified in (10). In chapter 3, reflexivization is analyzed as an instance of movement within the θ-domain; in chapter 4, contrastive left dislocation in German is analyzed as movement within the ω-domain, and clitic left dislocation in Greek as movement within the ϕ-domain. On the other hand, Grohmann also tries to corroborate the tripartition of the clause structure in (10) by exploring syntactic, discourse and semantic properties of left dislocation structures in chapter 4, and of multiple questions in chapter 5. For reasons of space, I only review his argumentation for the CDE.

2.1 Reflexivization

Grohmann's analysis of reflexivization as resulting from movement is very much like Hornstein's (2001). The basic assumption has been put forward originally by Hornstein in his analysis of obligatory control (Hornstein 1999): θ-roles can be checked after movement and there is no required biuniqueness between arguments and θ-roles. Thus, derivations like (1b) above are not blocked by the θ-Criterion; rather, some other constraint requires that the lower copy be spelled out as a reflexive, as in (7). Hornstein and Grohmann diverge, however, with respect to what the relevant constraint is.

For Hornstein, the reflexive morpheme *self* is part of the lexical array and is merged as an adjunct to an argument. The argument may then move; its lower copy will be deleted according to Nunes' analysis for the non-realization of ''traces'', as in (12a) below. It will eventually be spelled out as an ''elsewhere'' pronominal formative, however, for two reasons: the accusative Case must be checked (that is why it would appear as *him*) and *self*, as a bound morpheme, must be hosted:

(12)
a. [$_{vP}$ John likes-*v* [$_{VP}$ ~~likes~~ [[~~John~~] self]]]
b. [$_{TP}$ John T [$_{vP}$ ~~John~~ likes-*v* [$_{VP}$ ~~likes~~ [[him]-self]]]]

The analysis can be extended to reciprocals: *each other* is also merged with an argument; but the lower copy does not need to get spelled out as an ''elsewhere'' pronoun, since *each other* is not a bound morpheme.

For Grohmann, the lower copy is spelled out not because of Case or the presence of specific items in the lexical array, but because of a general principle, the CDE. Reflexivity results in two non-distinct copies in a prolific domain, the θ-domain; therefore, one of the copies must be spelled out with a ''different PF-matrix''. Reflexives and reciprocals are the ''elsewhere'' forms for the θ-domain: reflexives appear when ''identity'' is the intended LF representation; reciprocals appear when ''reciprocity'' is intended. (Grohmann sustains that reflexives and reciprocals are purely grammatical formatives, with no specific meaning contribution, cf. p. 139 and ff., but see Hornstein 2001, p. 163 and ff.)

Given the similarities between the two analyses, the question is: is there any evidence that would favor the CDE analysis over Hornstein's? Grohmann compares them with respect to one type of structure, namely, ''detransitivized'' clauses like (13):

(13)
a. The fish killed
   (killed something, not themselves or each other)
b. Bill and Paul shaved
   (shaved themselves, not each other or somebody)

c. Bill and Mary met
(met each other, not themselves or somebody)

Under Hornstein's analysis, the spelling out of the lower copy would be required by the need of checking (accusative) Case. Predicates like the ones above do not seem to assign Case, however; hence, they should allow the object to move freely, with no need for the spelling out of the lower copy. That is, they should have both the reflexive and the reciprocal reading with an ''implicit object'', contrary to fact: the choice between an ''arbitrary'', reflexive or reciprocal reading appears, rather, to be idiosyncratic.

Note that Grohmann's argument is a negative one: indeed, the cases in (13) might be a problem for Hornstein's assumptions. But do they follow from the CDE analysis without additional assumptions? It appears they do not. To account for (13), Grohmann assumes something blocks movement with such ''intransitive'' verbs – hence, the idiosyncratic absence of the reflexive or the reciprocal reading. And following Hornstein's (1999, 2001) treatment of arbitrary PRO, Grohmann assumes that 'the grammatical formative *pro* can be inserted whenever movement is not possible' (p.131). Such *pro* receives a specific reading because, as an ''elsewhere'' formative, 'inserted when no movement can take place, it better be unambiguous' (p.141). Apparently, what determines ''absence of movement'' and the specific reading of *pro* are inherent properties of the predicates.

The assumptions I have just mentioned cannot be deduced from Grohmann's CDE is analysis. Moreover, they do not seem to be necessarily in contradiction with Hornstein's analysis: if he adopted similar assumptions, his analysis could probably be maintained with no substantial loss. Thus, the argument based on (13) would not seem to be decisive, and the evidence it provides for the CDE is inconclusive. There are, on the other hand, a few cases that pose no problem for Hornstein, but which require some elaboration under Grohmann's assumptions. (14) and (15) below are two examples:

(14)
a. John seemed to himself to hate Mary
b. [$_{TP}$ John [$_{VP}$ seemed to ~~John~~ ➲ **himself** [$_{TP}$ ~~John~~ to [$_{vP}$ ~~John~~ *v* [$_{VP}$ hate Mary]]]]]

(15)
a. John protected himself from himself
b. [$_{vP}$ John protected-*v* [$_{VP}$ ~~John~~ ➲ **himself** [$_{V'}$ ~~protected~~ [$_{PP}$ from ~~John~~ ➲ **himself**]]]]

(14b) is most probably the derivation Grohmann would assign to (14a) (for his assumptions on raising, pp. 296-300). The occurrence of *himself* would result from moving *John* in the embedded Spec-of-TP to the object position of *to*, and then moving it again to the matrix Spec-of-TP. Crucially, *seem* does not have an external argument and, therefore, there is no intermediate movement of *John* to Spec-of-*v*P in the matrix clause (Grohmann, pp. 87-92). Since the PP headed by *to* is presumably within the matrix θ-domain (of *seem*), and Spec-of-TP is in the matrix ϕ-domain, movement of *John* from the object of *to* to Spec-of-TP is *not* within a prolific domain. Hence, the spelling out of *himself* is not required by the CDE; still, it is needed. For Hornstein, (14) poses no problem: the copy governed by *to* must be spelled out because there is an oblique Case to be checked.

Consider now (15b) (Grohmann assumes a larsonian-like structure for ditransitives, cf. pp. 66-69). The two lower copies of *John* are non-distinct at LF. Despite the CDE, however, they are *not* spelled out by ''different PF-matrices'' – both are spelled out as *himself*. Of course, a minor reformulation would do: the lower copies must have a PF-matrix that differs from the head of the chain only, not from each other. But the problem lies in the conceptual motivation for the CDE: the idea was precisely to ensure ''visibility'', or non-ambiguity, in the matching between LF copies and PF matrices. As for Hornstein's analysis, it should be clear that (15) poses no problem: there are two Cases to be checked, and no requirement for ''different PF matrices''; hence, the two copies must and can be spelled out as *himself*, with no further ado.

Extending the discussion, it might be added that the program of reducing reflexivization and bound anaphora to movement itself faces many problems, some affecting Hornstein and Grohmann's analyses alike. Let me mention one, related to the typology of local reflexives:

(16)
a. O psicanalista$_i$ protegeu João$_j$ de si mesmo$_{i/j}$
The psychoanalyst$_i$ protected John$_j$ from himself$_{i/j}$
b. O psicanalista$_i$ falou com João$_j$ de si mesmo$_{i/*j}$
The psychoanalyst$_i$ spoke to John$_j$ about himself$_{i/j}$

(16) illustrates a well-known difference between anaphors like *himself* and the so-called SE anaphors, here exemplified with Portuguese *si mesmo* (on this distinction, see Reinhart & Reuland 1993; for a discussion of examples like (16), Faltz 1985 and Hellan 1988). The difference is usually described as having to do with the subject orientation of SE forms, although the contrast between (16a) and (16b) suggests it may have to do with c-command. Specifically, SE forms seem to require a c-commanding antecedent, while forms like *himself* do not. This might indicate that the movement analogy is appropriate for SE forms; but it casts doubts on this analogy for anaphors like *himself*.

To sum up: the CDE analysis of reflexivization is nicer than Hornstein's from a conceptual point of view. The CDE is a general constraint, applying to many possible types of movement, and is well grounded in Grohmann's theory of the cycle. Hornstein's analysis of reflexivization does not generalize in the same way, nor is it conceptually attractive on other grounds. Empirically, however, Grohmann's analysis is less persuasive. The argument based on ''detransitivized structures'' is not conclusive; and there are cases that do favor Hornstein's. Moreover, well-known facts about binding still

require a proper account under derivational approaches like Grohmann's. Only further research will show, therefore, whether binding phenomena can provide a secure argument for the CDE.

2.2 Left dislocation structures

The other arguments Grohmann provides for the CDE are based on two left dislocation structures, namely, *contrastive left dislocation* in German and *clitic left dislocation* (especially in Modern Greek). As is well-known, *hanging topic left dislocation*, illustrated in (17a) below, contrasts with the similar *topicalization* in (17b) as far as movement diagnostics are concerned: only the latter shows connectivity or reconstruction effects, as well as sensitivity to islands (Chomsky 1977, Cinque 1977; see Grohmann, chapter 4, for a survey of the literature):

(17)
a. That girl$_i$, I know her$_i$ very well
b. That girl$_i$, I know __$_i$ very well

In most analyses, (17b) but not (17a) involves movement. In Grohmann's, *that girl* moves to Spec-of-CP in (17b), and is ''base-generated'' as an adjunct to CP in (17a).

Contrastive and clitic left dislocation are like hanging topic structures in having pronominal resumption, but closer to topicalization as far as movement diagnostics are concerned. For example, they show connectivity effects and island-sensitivity, as illustrated by *German contrastive left dislocation* (Grohmann's examples from p. 160):

(18)
a. [Seinen$_j$ besten Freund]$_i$, den$_i$ sollte jeder$_j$
[His best friend], that should everyone
gut behandeln
well treat
'[His$_j$ best friend]$_i$, everyone$_j$ should treat (*him$_i$) well'
b. *Den Martin$_i$, den$_i$ hat Maria die Tatsache
The Martin, that has Maria the fact
geglaubt mögen alle
believed like all
'Martin$_i$, Maria believed the fact (that) everyone likes *(him$_i$)'

In this German structure, the first position of more usual V2 clauses – the ''topic'' position – is occupied by the resumptive demonstrative; and the left-dislocated constituent must precede the pronoun (Grohmann, pp. 184-188). The derivation Grohmann proposes for it is as follows (cf. his (55a), p.184):

(19)
CONTRASTIVE LEFT DISLOCATION
[$_{CP}$ XP C [$_{TopP}$ ~~XP~~ ⊃ pronoun V-Top ...
[$_{TP}$ ... ~~XP~~ ... [$_{vP}$ ... ~~XP~~ ...

According to (19), the demonstrative is the spelling out of a copy of the left-dislocated XP. As Grohmann shows, this explains many differences between contrastive left dislocation and the hanging topic structure in German, which is superficially similar but has no movement. For example, only contrastive left dislocation shows connectivity. And the XP in (19) can be of any category and matches the demonstrative in Case, while no such properties are found in the hanging topic construction (Grohmann, p. 158 and ff.). Thus, there is a sound empirical basis for claiming that German contrastive left dislocation does involve movement.

Theoretically, the relevant aspect of (19) is the movement of XP from Spec-of-TopP to Spec-of-CP, which happens within a prolific domain, the ω-domain. The CDE should apply, and the lower copy of XP should be spelled out as a ''different PF-matrix''. Indeed, it surfaces as a resumptive demonstrative. Thus, contrastive left dislocation does seem to support the idea that *the CDE is operative in the ω-domain*.

Grohmann's analysis of *clitic left dislocation* follows a similar line, now arguing for movement within the ϕ-domain. This is shown in the derivation below, proposed for examples like (8c) in his summary (cf. his (85), pp. 204-205):

(20)
CLITIC LEFT DISLOCATION
[$_{TopP}$ DP ... [$_{TP}$ ... [$_{AgrP}$ ~~DP~~ [$_{Agr}$ ~~DP~~ ⊃ clitic-V]
[$_{vP}$ ... ~~V~~ ... ~~DP~~ ...

The DP's movement captures what clitic left dislocation has in common with topicalization and contrastive left dislocation, namely, movement properties – especially connectivity and island-sensitivity. The fact that DP moves to Spec-of-TopP in (20), while XP moves to Spec-of-CP in (19), explains some differences between the two structures; for example, why only clitic left dislocation appears in embedded clauses and allows more than one left-dislocated constituent (Grohmann, p. 194 and ff.).

Crucial in (20) is, of course, the proposal that DP first adjoins to V in Agr and then moves to Spec-of-AgrP. This movement happens within the ϕ-domain; the CDE applies, and the lower copy of DP must be spelled out as a different PF-matrix – as the clitic (see Grohmann, pp. 202-207, for details). Now, besides the support it provides for the CDE, would there be any further argument for this ϕ-domain internal movement? There is one: it would answer an objection Cinque (1990, pp. 60-63) raised against a movement analysis of clitic left dislocation, which goes as follows: If the DP had moved *directly* to the left-dislocated position, an A-bar position, and the clitic were its spelled-out trace in (20), the clitic would be a variable at S-Structure. Now, S-Structure variables license parasitic gaps, but clitic left dislocation does not. Cinque's conclusion is that the clitic is not a spelled-out trace.

As Grohmann observes, however, the objection does not carry over to (20). This derivation has *an intermediate step*: before moving to Spec-of-TopP, the

DP lands in Spec-of-AgrP, an A-position; hence, the clitic is not A-bar bound – it is not an S-Structure variable (pp. 201-202). Thus, (20) allows Grohmann to simultaneously capture the movement properties of clitic left dislocation and the fact that it does not license parasitic gaps. This certainly is a good argument for (20). More importantly, (20) would show that *the CDE does apply to movement within the φ-domain* as well.

It appears, therefore, that Grohmann's arguments for the CDE based on left dislocation structures are well shored up empirically: there are good reasons to assume that contrastive and clitic left dislocation involve movement; moreover, the prolific domain internal movements proposed capture properties of these structures that would be problematic otherwise.

Many aspects of the analyses would deserve discussion; I would like to mention only one. Drawing specially on Cinque (1977, 1990) and Anagnostopoulou (1994, 1997), Grohmann proposed a movement analysis of clitic left dislocation based on two diagnostics: connectivity and island-sensitivity. But as he acknowledges (pp. 195-196), clitic left dislocation is sensitive only to a subset of the islands that block movement in Italian and Greek. (Precisely which subset is relevant has been a matter of debate: see Cinque 1990, p. 64 and ff., and Anagnostopoulou 1994, p. 133 and ff.) For Cinque and Anagnostopoulou, the relevant differences in locality effects are accounted for by the assumption that the dislocated constituent in clitic left dislocation is ''base-generated'' in its surface position. Under Grohmann's analysis, another solution must be found, of course.

3. A few conceptual issues

I would like to conclude this review by looking at a few conceptual issues raised by Grohmann's proposals. Some concern the notion of ''drastic effect on the PF output''. In the CDE's formulation, it is defined as ''a different realization of an object's copy at PF''. This already states clearly what is required: the relevant copy must be ''realized'' by a different PF-matrix – a pronominal form. Crucially, deletion must be excluded. However, coming to think of it, deletion is certainly a ''drastic effect on the PF output'', so why wouldn't it do the job? Conceptually, the idea seems to be: only spelling out all copies with different PF-matrices allows the proper identification of all ''functions'' the constituent has in the relevant prolific domain. But this line of thinking faces at least two problems.

One, pointed out before, is the existence of cases like (15). The other is that deletion, by itself, does not disturb the identification of ''functions'' even under adverse circumstances, as in the cyclic movement of adjuncts, the long movement of arguments (out of weak islands), or in ''multi-functional'' chains (for example, in parasitic gap structures under the ''sideward movement'' analysis of Nunes 1995, 2001, and Hornstein 2000). In all these cases, deletion allows the identification of the ''functions'' of a constituent, despite the fact that the relevant connection will be ''non-local'' at surface, that is, at PF. Why would deletion block identification of ''functions'' precisely when the connection is ''local'', that is, within a prolific domain? Clearly, a deeper discussion of the conceptual nature of the CDE and of its effects is needed if it is to explain the absence of ''local deletion''.

There is another issue concerning the role of deletion and resumption in PF convergence. The current minimalist explanation for the non-realization of traces is due to Nunes (1995, 2001), who derives it from the assumption that linearization at PF is guided by Kayne's Linear Correspondence Axiom [LCA]. According to Nunes, the spelling out of non-distinct copies in a chain induces violations of the irreflexivity and asymmetry requirements of the LCA. The deletion of all but one of the copies allows the chain to be linearized at PF, and economy considerations make the deletion of the lower copies the optimal derivation.

For Grohmann, resumption also allows the spelling out of a chain, and is required in the case of movement within a prolific domain (where deletion is not an option). Since the ''resumptive chains'' discussed by Grohmann are all well formed, they presumably satisfy all convergence requirements at PF, *including the LCA*. In other words, resumption not only allows a chain to satisfy the CDE, but also to be linearized (Grohmann, p. 61, fn. 27). But, if that is the case, why can't resumption be used to linearize standard chains (as in ***What did John see it?*)? Conceivably, the choice has to do with economy – both types of derivation converge, but deletion is more economical. It would, therefore, be interesting to see whether current assumptions about economy could deal with this issue properly, and whether it could throw light on competing conceptions.

4. Conclusion

Grohmann's dissertation is a fine piece of minimalist theorizing, a major contribution to a central desideratum of the program: it develops a theory of the derivational cycle that is both conceptually attractive and rich in empirical consequences. The main insight is that the interfaces are cyclically fed by the computational system on the basis of functionally defined clusters of information. This explains why the clause structure is partitioned in functionally defined areas, and provides the conceptual basis for Grohmann's CDE. The effect of this interface condition is that many conceivable chains will require the spelling out of lower copies as pronominal forms, or resumption. For reflexivization, the result is a more principled account than Hornstein's, still in full consonance with his program of reducing construal to movement. Empirically, contrastive left dislocation and clitic left dislocation provide good arguments for the CDE;

reflexivization, on the other hand, a less persuasive one. Some interesting issues arise: is there an explanation for the differences between standard and resumptive chains as regards island-sensitivity? why can't deletion count as a ''drastic effect on the PF output'' when movement is within a prolific domain? why can't the LCA be satisfied by resumption in standard chains? Many other important aspects of Grohmann's work have not been touched (for example, his proposals concerning multiple questions). The richness of the discussion leaves no doubt: his dissertation is highly recommendable reading for anyone interested in recent syntactic theory.

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