Multi- vs. bi-dimensional trees for capturing the pre-theoretical notion 'pivot': The (dis)preferred status of 'Grafting'

Alexander Grosu, Tel Aviv University; grosua@post.tau.ac.il

0. Introduction

In the 80-s and 90-s, multi-dimensional trees and/or multiple motherhood were appealed to in two types of situation where 'standard' trees seemed to fail (see [I] and [II]). More recently, multiple motherhood became part of core grammar (see [III]), and a similar proposal involving both factors was also made (see [IV]).

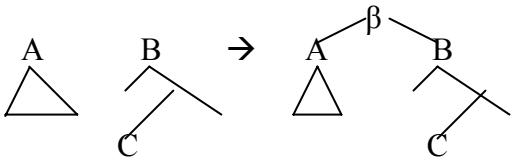
[I] ***Multi-dimensionality*** **and** ***multiple motherhood in coordination*** **for dealing with 'collective' readings, e.g., [1] (Moltmann 1992)**

[1] a. John bought and Mary sold *a total of ten cars.*
b. John ate and Mary drank everything that there was on the table.

Multi-dimensionality without multiple motherhood **for dealing with appositive relatives and parentheticals (Cinque 1982; demonstration omitted)**

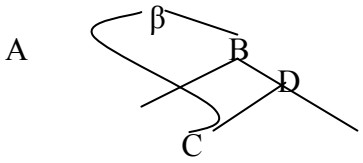
Multiple motherhood without multi-dimensionality: **Chomsky's (2004) re-analysis of Movement/Internal Merger as Re-Merger. In Figure 2, C is a daughter of D and β.**

Multiple motherhood **and** ***multidimensionality outside coordination*****: Grafting (van Riemsdijk 2006 and references therein),** ***used for capturing the pre-theoretical notion 'pivot' or 'phrasal head'*****. Grafting is in effect Re-Merger of a sub-node of a bi-dimensional sub-tree with the root of another bi-dimensional sub-tree (see Figure 3, where D is a daughter of both E and β).**



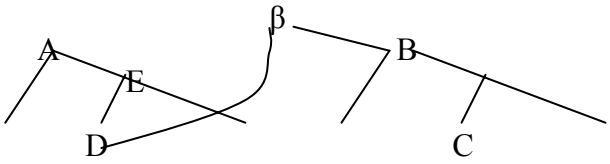
← **External Merger**

Figure 1



← **Internal Re-Merger**

Figure 2



← **Grafting**

Figure 3

Van Riemsdijk's (2006) *conceptual* argument for Grafting: Given Internal Re-Merger and the possibility of building up a tree by constructing multiple sub-trees in parallel (Chomsky 1993), Grafting follows effortlessly from the null hypothesis. A full evaluation of Grafting, however, needs to balance this advantage against the cost of constraining the huge over-generation that is allowed, and the conceptual and empirical cost involved in specific analyses must be carefully examined.

This talk will compare the empirical and conceptual (de)merits of Grafting analyses proposed for a number of constructions with those of alternative bi-dimensional analyses. The conclusion that will be reached is that Grafting is not superior to its competitors wrt to any of these constructions, and is in fact inferior in certain cases.

1. Free relatives (FRs)

[2] a. He will invite [*whoever* you invite __].
b. He will buy [{*what(ever), whichever books, however many books*} you are willing to sell __].
c. He can sing [*however erect* you want him to sing __].
d. He will sing [*however often* you ask him to sing __].
e. He can certainly be [*what(ever)* his mother most wants him to become __]: a lawyer, a doctor, or whatever.

Pivot: the fronted wh-phrase (in italics in [2]). Van Riemsdijk proposes to settle the old debate between a CP-external view of the pivot (Bresnan & Grimshaw 1978) and a CP-internal one, the external head being a null category (Groos & Van Riemsdijk 1981, and various subsequent writers) as follows: that the pivot is both internal and external. He dismisses the possibility of a *bi-dimensional* chain of identical copies on the grounds that this requires assigning distinct theta roles to links of the same chain, and proposes a Grafting analysis, assuming that theta-roles are defined only on bi-dimensional trees.

It is unclear, however, why the old dispute needs to be 'settled.' In Grosu (2003) I showed in detail that the null-head analysis can adequately deal with all the properties of FRs.

2. The *far from simple/close to trivial* construction

Pivot: in italics in [3a,c]

[3] a. This problem is [$_{AP}$ close to *trivial*].
b. The airport is [$_{AP}$ close to the city].
c. This is a [$_{AP}$ close to [$_{AP}$ *trivial*]] matter.
d. This is a [$_{AP}$ close (*to the airport)] city.

[4] **The Head Final Filter** [responsible for [2d]]
An XP left-adjoined to a head-initial projection needs to exhibit its own X head at its right edge.

Van Riemsdijk: In [3c], there are two bi-dimensional trees, with *trivial* shared by both:

[5] [close [to **trivial**] → **graft tree**
[this is a **trivial** matter] → **host tree**

Kajita (1977): *close to trivial* starts its syntactic derivational 'life' as [6a], and is then re-analyzed as [6b], with a new head/pivot, and with *close to* re-analyzed as an adverbial modifier of the derived head.

[6] a. [$_{AP}$ **close** [$_{PP}$ to trivial]]
b. [$_{AP}$ close to [$_{AP}$ **trivial**]]

Either approach must deal with two facts not addressed by either author: the construction is (i) language-specific, and (ii) subject to strict locality conditions (see [7] and [8]-[9]).

[7] a. These people are [far from innocent]. ← **English**
b. Deze mensen zijn [verre van onschuldig]. ← **Dutch**
c. *Diese Leute sind [weit (entfernt) von unschuldig]. ← **German**
d. *Ces gens sont [loin d'innocents]. ← **French**
e. *Indivizii ăştia sunt [departe de nevinovați]. ← **Romanian**
f. *Ha-anashim ha-ele [rexokim mi xafim mi-pesha]. ← **Hebrew**

[8] a. These people are [far from *being* innocent]. ← **English**
b. Deze mensen zijn [verre van (om) onschuldig *te zijn*]. ← **Dutch**
c. Diese Leute sind [weit davon entfernt, unschuldig *zu sein*]. ← **German**
d. Ces gens sont [loin d'*être* innocents]. ← **French**
e. Indivizii ăştia sunt [departe de *a fi* nevinovați]. ← **Romanian**
d. Ha-anashim ha-ele [rexokim mi *lihyot* hafim mi pesha]. ← **Hebrew**
[9] a. This is a [far from (*being) interesting] proposal. ← **English**
a. Voici une [(*loin d'être) intéressante] proposition. ← **French**
b. Iată o (*departe de a fi) interesantă propunere. ← **Romanian**

[8]-[9] indicate that Grafting needs to be limited to a very local domain, e.g., a phase. This can be achieved by allowing Grafting to operate only at the point where a phase has been completed and is about to undergo transfer to the interfaces. However, precisely this assumption turns out to be problematic for the next construction.

3. Transparent Free Relatives

<u>Pivot: a post-copular phrase or small-clause non-subject, in italics in [10]-[11]</u>.

[10] a. John is talking to [$_{DP}$ what seems [__ to be [$_{DP}$ {*a policeman, his brother-in-law*}]]].
b. John is [what I might describe [__ as [$_{AP}$ *exceedingly interested in magic*]]].
c. John is a [$_{AP}$ devious and [$_{AP}$ what some people might describe
[__ as [$_{AP}$ *highly unreliable*]]]] individual.
[11] a. Ich habe mir [was man als *einen schnellen Wagen* bezeichnen könnte] gekauft.
I have me what one as a fast car.ACC describe could bought
'I have bought myself what one might call a fast car.'
b. I just noticed [what may well seem [to be construable as *an NP* by
proponents of LFG] to people unfamiliar with that theory].

Both Kajita and Van Riemsdijk propose to extend re-analysis/Grafting to TFRs, relying on data like [10]. Van Riemsdijk, however, points out that only Grafting can work for TFRs like [11].

Conceptual problems: [A] TFRs, unlike *far from simple*, exhibit no locality restrictions. Van Riemsdijk (2006) notes this point, and proposes to allow Grafting to operate **before completion** of the phase immediately containing the candidate for Grafting. Such a view of Grafting fails, however, to account for locality in *far from simple.* The possibility to unify these two constructions by means of Grafting is thus in doubt.

[B] Non-local Grafting is an extremely powerful device, which over-generates massively. E.g., all island violations would be ruled in given the possibility of an alternative Grafting analysis. Proponents of Grafting must show how this can be kept under control.

Grafting analysis of [10a]:

[12] John is talking to *a policeman* [Host tree]
what seems to be *a policeman* [Graft tree]

Analysis of [10a] in (Grosu 2007a,b): The gross configurational structure of [10a] is exactly the same as that of a similar looking FR, e.g., [13] (null external head, wh-phrase in Spec, CP).

[13] a. John is talking to who(ever) seemed (to Mary) to be a policeman.
b. John is looking at what seems (to him) to be disgusting.

Differences from FRs: The wh-phrase, which in TFRs is exclusively *what* or a cross-linguistic counterpart, as well as the (null or overt) external head, are syntactically and semantically under-specified, and the relative C(P) is unspecified for definiteness. Furthermore, the copular structure/small clause is equational. Equation and the under-specified wh-chain form a 'transparency channel' through which the post-copular phrase can convey its properties to the TFR, thereby acting as a pivot.

The two approaches provide a 'direct' vs. 'indirect' account of pivot status. I illustrate the operation of the indirect approach.

Given equation and the under-specificity of *what* wrt logical type, the type of the TFR is guaranteed to be identical to that of the pivot, i.e., individual concept, property, etc. Concerning syntax, there are demonstrable instances of feature transfer under equation, in particular, syntactic number and adjectival agreement:

[A] a. What {bothers, *bother} you?
b. What seem to be the problems?
[B] a. [What was lying on the desk a moment ago] {is, *are} now in the drawer.
b. [What seem to be *three books*] {are, *is} lying on the desk
[C] *Bill ontdekte een [$_{AP}$ wat ik zou noemen **eenvoudig-*(e)**] oplossing* (Dutch)
Bill discovered a [what I would call simple] solution

Since it can be shown that *what* can be under-specified for animacy and syntactic category as well, it seems reasonable to assume that these properties are transferable under equation as well, as in [D] and [11] respectively.

[D] She is talking to [what seems to be {a policeman, Bill, her brother-in-law}].

One other property that can be traced to equation *cum* [F] is 'specificity', as in [E].

[E] a. There is {a virus (#I designed), #the dreaded virus} in this program.
b. There is [what appears to be {a virus (#I designed), #the dreaded virus}] in this program.
[F] The *raison d'être* of a TFR is to denote a 'version' or 'counterpart' of the pivot at indices other than those at which the pivot is defined.

Since the TFR denotes in effect the same entity/entities as the pivot does, with the proviso that the properties of its denotatum may be different from those of the pivot, this denotatum will have the same degree of specificity as the denotatum of the pivot.

However, since its precise nature is left unspecified, it is in general more appropriately paraphrased by an indefinite, even when the pivot is definite. For example, [Eb] with *the dreaded virus* is better paraphrased as 'there is something that appears to be …' than 'there is the thing that appears to be …'. – Note that the direct approach needs to view this example as definite, which seems counterintuitive. It also suffers from other problems, to which we now turn.

Empirical comparison

The pivot does not behave like a CP-external head with respect to extractability (see [14]). It also does not exhibit Case-matching restrictions analogous to those found with wh-phrases in FRs (see [15]; also [18a], [19a], given [20]), but the wh-element does (see [16]-[19]). Finally, the indirect, but not the direct approach, allows a straightforward account of the semantics of TFRs.

[14] a. Who did he buy [a picture of __ (that pleased Mary)]?
b. Who did he buy [(?*what seems to many to be) a portrait of ___]?

[15] a. Ich habe mir soeben gekauft, [was von vielen als {*ein merkwürdiger Wagen*,
I have me just bought what by many as a strange.NOM car
**einen merkwürdigen Wagen}* bezeichnet werden würde].
a strange. ACC car described be would
'I have just bought myself what might be called a strange car by many people.'
b. [Was viele als *{*ein merkwürdiger Wagen, einen merkwürdigen Wagen}*
what many as a strange. NOM car a strange. ACC car
bezeichnen würden] wurde trotzdem soeben verkauft
describe would is nonetheless just sold
'What many people might describe as a strange car has nonetheless just been sold.'

[16] a. *Mit^{DAT} **was** hat er noch nicht gerechnet?*
with what has he yet not counted
b.****Was** hat er widersprochen^{DAT}?*
what has he contradicted
[17] a. *Er hat mit^{DAT} [**was** du gesagt hast] nicht gerechnet.*
he has with what you said have not counted
'He did not reckon with what you said.'
b.**Er hat [**was** du gesagt hast] nie widersprochen^{DAT}.*
he has what you said have never contradicted
'He has never contradicted what you said.'
[18] a. *Er wohnt in^{DAT} [**was** man ein-en Hühnerstall nennen koennte].*
he lives in what one a-ACC chicken-coop call could
'He lives in what one may call a chicken-coop.'
b.**Er hat [**was** man ein-e merkwuerdige Idee* nennen koennte] viel
he has what one a-ACC strange idea call could much
Aufmerksamkeit geschenkt^{DAT}.
attention given
'He has devoted considerable attention *(to) what one might call a strange idea.'
[19] a. *Sie spricht mit^{DAT} [**was** ich ein-en totalen Idioten nennen wuerde].*
she speaks with what I a-ACC total idiot call would
'She is speaking with what I would call a total idiot.'

b.*Sie hat [**was** ich einen totalen Idioten nennen wuerde] soeben widersprochen^{DAT}.
she has what I an-ACC total idiot call would just contradicted
'She has just contradicted what I would call a total idiot.'

[20] a. *Er wohnt in {ein-em, *ein-en} Hühnerstall.*
He lives in a-DAT a-ACC chicken-coop
b. *Sie spricht mit {ein-em, *ein-en} totalen Idioten.*
She speaks with a- DAT a-ACC total idiot

The incontrovertible TFR status of [19] is brought out by [21].

[21] a. #She is talking to [{what was addressing a large audience yesterday],
that is to say, {a policeman, Bill, her brother-in-law}.
b. She is talking to [what seems to be {a policeman, Bill, her brother-in-law}].

Pragmatics and semantics of TFRs; comparison of the two approaches

Pragmatic *raison d'être* of TFRs (repeated in [22]):

[22] The *raison d'être* of a TFR is to denote a 'version' or 'counterpart' of the pivot at indices other than those at which the pivot is defined.

For this to be fulfilled, it is necessary for the pivot to be in the scope of an explicit or implicit CP-internal intensional operator (modal temporal, etc.), and for the TFR to be defined at different indices, e.g., those of the matrix clause. When no intensional operator is detectable, TFRs are infelicitous, which is generally the case when equation serves no useful pragmatic or semantic purpose (see [23] and [23], where the [a] sub-cases purport to mean nothing more than the [b] sub-cases).

[23] a. #He is eating with [what is {a, your} fork]. =
b. He is eating with {a, your} fork.
[23] a. #Mary, I love [someone who is (identical to) you]. =
b. Mary, I love you.

Grafting analysis: the pivot is both external and internal to the relative CP, with the external copy pronounced, and the internal copy, interpreted. This implies 'reconstruction' **into the post-copular position**. But incontrovertible instances of such reconstructions are very differently interpreted. Thus, consider EIRs like in [24] (to be discussed in detail in my second talk), whose *raison d'être* is shown in [25].

[24] The *gifted mathematician* that Bill allegedly is should have solved this trivial problem with greater ease.

[25] The *raison d'être* of an EIR is to denote a 'version' of the copular subject which possesses the property denoted by the external NP at the indices of a CP-internal intensional operator.

In short, EIRs are defined at the indices of an internal operator, while TFRs are defined at matrix indices. This is mysterious und the Grafting approach to TFRs, but straightforward under the indirect approach, which assumes no reconstruction, and builds the meaning of the TFR on the basis of a **pre-copular variable**, which escapes the scope of the operator, and is existentially bound from the matrix.

Semantics of [21b], [10b]:

[21'] b. $\lambda i.\exists x_{<s,e>}$ [TALK-TO(i) (SHE(i), x(i)) $\wedge$ $\forall i' \in$ SEEM(i) [x(i') = BILL(i')]]

[10'] b. $\lambda i.\exists P_{<s,<e,t>>}$ [P(i) (JOHN(i)) $\wedge$ $\forall i' \in$ IMD(i) [P(i') = EIM(i')]]

Conceptual comparison

A number of properties of TFRs seem accidental from the Grafting perspective, but make good sense from the indirect perspective.

[26] Exceptionlessly identical morpho-syntax of the left periphery in FRs and TFRs.
French: *what*-FRs and TFRs are both expressed by *ce que/qui*.
Hebrew: FRs and TFRs are the only constructions of the language with a doubly-filled COMP (*ma she* 'what that').
Follows if TFRs are under-specified FRs

[27] The left- periphery of TFRs is restricted to *what* and its cross-linguistic counterparts.
Only these may be sufficiently under-specified to allow transfer of properties from the pivot to the TFR.

[28] Not all languages with FRs allow TFRs.
In such languages, the crucial left periphery items resist under-specification.

[29] The wh-chain and the pivot occur as terms of a copular/small clause structure.
This structure ensures an equational relation between the terms, which is vital for the transfer of syntactic and semantic properties.

Some illustrations of feature transfer:

[30] a. What {bothers, *bother} you?
b. What seem to be the problems?
[31] a. [What was lying on the desk a moment ago] {is, *are} now in the drawer.
b. [What seem to be *three books*] {are, *is} lying on the desk
[32] *Bill ontdekte een [$_{AP}$ wat ik zou noemen **eenvoudig-*(e)**] oplossing*
Bill discovered a [what I would call simple] solution
[33] a. John is [{what, something} I would describe as ridiculous].
b. John is an awkward and [{what, *something} I would describe as ridiculous] individual.

4. Horn Amalgams

Horn Amalgams:

[34] a. John is going to – I {think, regret to say} it's *Chicago* – on Saturday.
b. John is going to – is it *Chicago*? – on Saturday.

Van Riemsdijk (2006): **The italicized phrase is a pivot.**
Grosu (2007): HAs have no pivot. The string flanked by dashes is simply a parenthetical sentence, and the matrix is incomplete, in includes a gap corresponding to something the speaker refrains from uttering.

[35] a. *I think it's Chicago – is a large city.
b. *Is it Chicago? – is a large city.
b. *It is Chicago, isn't it? – has a most important university.
[36] a. Hasn't – I seem to recall it was Chicago – been once claimed to be the capital of the US?
b. Hasn't – it was Chicago, wasn't it? – been once claimed to be the capital of the US?

In sum, a Grafting approach to HAs is on the wrong track, because there is nothing to capture (no pivot).

HAs are of independent interest for their ability to shed light on an apparent puzzle for both the direct and the indirect approach, and found in [32] (reproduced below).

[32] *Bill ontdekte een [$_{AP}$ wat ik zou noemen **eenvoudig-*(e)**] oplossing*
Bill discovered a [what I would call simple] solution

Under either approach, there is an agreeing adjectival token in predicative position, something that Continental West Germanic languages generally disallow. Van Riemsdijk (2006) is aware of the problem, and suggests that only the adjectival stem is shared by both trees, the inflection being exclusively in the host tree. However, this approach will not work for TFRs like [38].

[37] a. Bill is a {false, pseudo-} prophet.
b.*This prophet is {false, pseudo}.
[38] He is a [dubious and [what most people might call {***false, pseudo***-}]] prophet.

The key lies in the observation that the restriction holds only for *strictly predicative,* but not for *equational* constructions:

[39] 'Alleged' is 'presumed'; 'pseudo' is 'false'; 'former' is 'earlier.'
[40] a. A: *Maria ist eine genial-e Frau*
Maria is a brilliant-AGR woman
b. B: *Was ist 'genial-e'?*
what is brilliant-AGR
c. A: *'Genial-e' ist 'sehr klug-e'.*
brilliant-AGR is very smart-AGR

[39]-[40] may have a meta-linguistic flavor, but this plausibly due to the fully specified status of the equated terms. HAs offer a perfect test case with an unspecified subject, and no pivot. Since [41]-[42] are not metalinguistic and still exhibit agreement, the point is demonstrated.

[41] *Bill ontdekte een, ik denk dat je het zou mogen noemen **eenvoudig-*(e)**, oplossing.*
Bill discovered a I think that you it would may call simple.Agr solution
'Bill discovered a – I think you may call that simple – solution.'
[42] The police have named Bill as the only – I think it's still ***presumed*** – murderer.

5. Andrews Amalgams

[43] John invited [you'll never *guess* [$_{DP}$ **how many people**]] to [you can *imagine* [$_{DP}$ **what kind of a party**]] at [it should *be obvious* [$_{DP}$ **which place**]] with [God only *knows* [$_{DP}$ **what purpose in mind**]], although he was [you can *guess* {[$_{AP}$ **how tired**, [$_{PP}$ **under what kind of pressure**]}].

Unlike HAs, Andrew Amalgams do have a pivot (the wh-remnant of Sluicing, boldfaced in [43]). This is brought out by the contrast between [35] and [44].

[35] a. *I think it's Chicago – is a large city.
b. *Is it Chicago? – is a large city.
b. *It is Chicago, isn't it? – has a most important university.
[44] a. [I don't need to tell you **what**] is still lying on my desk. ≠
b. I don't need to tell you [what is still lying on my desk].

<u>Grafting approach</u>: the sluiced wh-phrase is grafted unto the matrix.
<u>Bi-dimensional approach</u>: the AA has a null external head construed as a non-interrogative indefinite.

Either analysis can cope with a number of properties of AAs, in particular, the ways in which they contrast with standard Sluicing:

[A] P-stranding within the ellipsis of standard Sluicing is allowed just in case the language and/or the specific prepositional construction allow this process (Merchant 2006), as shown by the English/Romanian contrast in [45]. In AAs, however, this restriction is suspended in Romanian (see [46]).

[45] a. Bill wants to play poker with someone, but I am not sure **who** (he wants to play poker with).
b.*Ion a reuşit datorită cuiva, dar n-am să-ţi spun
Ion has succeeded thanks-to someone.Dat but not-have.1 Subj.Prt.-you.Sg.Dat tell
cui (a reuşit el datorită).
who.Dat has succeeded he thanks-to
'Ion succeeded thanks to someone, but I won't tell you who (he succeeded thanks to).'
[46] Ion a reuşit datorită [ştii tu **cui**] la examenul de ieri.
Ion has succeeded thanks-to know.2.Sg you.Sg who.Dat at exam-the of yesterday
'Ion succeeded thanks to [you know who] at yesterday's examination.'

[B] In standard Sluicing, ellipsis is optional, in AAs, it is obligatory, regardless of whether the ellipsis is syntactically or pragmatically controlled (for these notions, see Hankamer and Sag 1976).

<u>Pragmatic control:</u>
[47] Standard: *(Context: someone discovers a murdered relative)*
My God, who (could have done this)?
[48] AAs: a. Bob sent me [you can easily guess **what** (*he sent me)].
b. Does [you know **who** (*I am thinking of)] want to kill me?

[C] In standard Sluicing, the morphological Case and/or syntactic category of the wh-phrase are determined ellipsis-internally, in AAs, they reflect the Case/category requirements of the matrix slot filled by the AA (see [49]).

[49] Vrea (cu adevărat) [ştii tu **(*la) cine**] să mă omoare?
wants with truth know.2.Sg you.Sg at who Subj.Prt. me kill
'Does [you know who] (really) want to kill me?'

One potential problem for Grafting: Swiping is allowed in standard Sluicing ([50a]), but not in *in situ* positions in the matrix ([51]). If [50b] is an instance of AA, not of HA, the Grafting approach has a problem.

[50] a. I heard John is involved with someone, I wonder **who with**. *[SSC]*
b. Bill has been involved [$_{PP}$ you will never guess **who with**] since August. *[AA]*
[51] a. Who spoke {with whom, *who with} yesterday?
b. Napoleon shouted {at whom, *who at} before the battle of Austerlitz?

Conjecture concerning the obligatory character of Sluicing: the pivot must in absolute final position within the AA (for saliency?).

[52] Bob swallowed [I won't reveal **what** (#*to anybody*)] last Sunday. (AA)

6. Conclusion

Grafting is at best no worse than its bi-dimensional competitors wrt FRs and AAs, inapplicable to HAs, and fraught with difficulties in connection with the joint treatment of TFRs and the *far from simple* construction.

Conjecture: Language learners and users appeal to multi-dimensionality just in cases where bi-dimensional analysis cannot succeed.