Copies at the Interfaces[1]

Andreas Pankau, UiL OTS Utrecht, Andreas.Pankau@let.uu.nl

1. Introduction

In this paper we will show that current formulations of the Copy Theory of Movement make wrong predictions about the interpretation copies get at the interfaces. This problem however doesn't stem from the idea of movement being copying but from the minimalist conception of unvalued features. Modifying this conception, coupling it with standard assumptions about structure building and with the idea of movement being copying gives the desired results. The benefits of our modified CTM will be exemplified by showing that spelled-out and non-spelled-out copies can be uniformly described.

2. The Copy Theory of Movement

Chomsky (1993) revives an idea of Chomsky (1975) that movement is a complex operation, consisting of a copy operation followed by a merge operation. This is also known as the *Copy Theory of Movement* (henceforth CTM). Accordingly, a simple constituent question as in (1a) no longer has a structure with a trace (Chomsky 1973) in the base position of the moved wh-phrase (1b), but a structure with a copy of the wh-phrase in the base position.

(1) a. *Who does Mary love?*
b. Who$_i$ does Mary love t_i?
c. Who does Mary love who?

The difference between a trace and a copy is that the trace is a separate element whose connection to the wh-phrase is mediated by an index, whereas the connection between the copy and the wh-phrase is simply one of identity. The CTM is preferable both on theoretical and on empirical grounds: it avoids the introduction of non-lexical material, like indices and traces, and reconstruction effects are naturally explained (Sportiche 2006). Apart from these general considerations, what is more specifically assumed is that the several copies of a lexical item do not differ in their feature specification, i.e. that they are identical with respect to the valued features they contain. Consider the following quotations from Chomsky (1995) and Epstein & Seely (2002):

[1] I'm indebted to Norbert Corver, Gaetano Fiorin, Vasiliki Koukoulioti, Eric Reuland, Anna Roussou, Neil Smith, and Craig Thiersch for helpful comments on earlier versions of the paper.

"Though α and its trace are identical, the two positions are distinct"
"... if one [member of the chain] is affected by an operation, all are."
(Chomsky 1995, p. 252; p. 381 fn. 12)

"Under copy theory, it is assumed that the Case feature on the *identical* copy is also valued, otherwise movement would never yield convergence."
(Epstein & Seely 2002, p. 79)

The general idea of movement as copying coupled with this specific assumption predicts that all copies of a lexical item have the same properties. However, looking at movement structures reveals that this prediction is not borne out.

3. Problems with the Copy Theory of Movement

The idea of copies being identical leads to three problems. Firstly, not all copies are spelled-out. Secondly, the copies are interpreted non-identically at the interfaces. Thirdly, the direction of the non-identity is fixed. We will now turn to each problem in detail.

The problem of the non-spellout of certain copies (let's call it the *trace-problem*) is well-known and doesn't require much explication; the problem is illustrated in (2).

(2) a. Who does Mary love 𝕨𝕙𝕠?
b. √*Who does Mary love?*
c. **Who does Mary love who?*

Although the structure of a wh-question contains two copies (2a), only one of them is pronounced (2b); pronouncing both leads to ungrammaticality (2c). Since the trace-problem arose immediately with the adoption of the CTM, Chomsky proposed the operation DELETE which deletes the phonological content (and only the phonological content) of all but the highest copy (Chomsky 1995, p. 202).[2] This indeed gives the desired result for (2). Equipping UG with this operation predicts that in movement structures it is always the case that only the highest copy will be spelled-out. However, this prediction is not borne out: there are cases in which more than the highest copy is spelled-out.

(3) **Wen** glaubst du ***(wen)** sie **(*wen)** liebt?
whom think you whom she loves
Who do you think that she loves?

(3) illustrates wh-copying in German.[3] Apart from providing evidence against the universal application of DELETE, the example additionally

[2] Chomsky originally proposed that DELETE comes for free, given the existence of ellipsis; Nunes (2004) convincingly argues that this parallel is misguided. In later writings, Chomsky refers to "computational efficiency" as the factor responsible for the deletion; however, as he himself notices (Chomsky 2007, p.12), this is only true for the PF interface.

highlights the problem that the spellout of several copies is regulated by non-trivial constraints: the intermediate copy must be spelled-out, the one in the base position cannot be. Another problem can be observed by looking at true resumption constructions[4]; consider the examples from Swedish.

(4) a. **Vilken fånge** var det läkarna inte kunde avgöra om **han**
which prisoner was it the-doctors not could decide if he
verkligen var sjuk utan att tala med ***pg*** personligen?
really was ill without to talk with *pg* personally
Which prisoner was it the doctors couldn't determine if he really was ill without talking to in person?
(Engdahl 1982, p. 164)

b. ***Vilken king** hänger många porträtt av **honom** på Gripsholm
which king hang many portraits of him at Gripsholm
Which king hang many portraits of at Gripsholm?
(Engdahl 1985, p. 8)

(4a) merely shows that resumptive pronouns in Swedish truly behave like elements generated through wh-movement – i.e. like A'-traces – given their ability to license parasitic gaps (abbreviated as *pg* in the example); this property is not shared by resumptive pronouns that are not generated through movement, as in English (cf. fn. 4). (4b) illustrates the problem: the spellout of several copies is not necessarily accomplished by some output effect, as often suggested.[5] The sentence in (4b) with a true resumptive pronoun is as ungrammatical as without it. This in turn means that the application of DELETE cannot be guided by some interface conditions.

The second problem is that although the two copies are identical in the sense of being the same lexical item, they don't behave identically, i.e. they are differently interpreted at the interfaces. Let's call it the *non-identity-problem*. Consider again a wh-question. The interpretation it should get is displayed in (5b) and the interpretation it does get in (5b').

(5) a. **Who** does Mary love who?
b. ***[for which x]**, Mary loves **[for which x]**
b'. √**[for which x]**, Mary loves **[x]**

[3] An account of wh-copying in terms of complementizer agreement (Thronton & Crain 1994, Kampen 1997) faces at least two problems. Firstly, PPs can appear in these constructions; PPs therefore have to be heads, which they however aren't. Secondly, some speakers have wh-copying optionally; this is unexpected given that agreement usually isn't an optional process.

[4] Cf. Sells (1984) for the difference between resumption and intrusion. According to this distinction, Ross' (1967) resumptive pronouns in English are actually intrusive pronouns.

[5] Beginning with Ross (1967), spelling out elements in the base position was argued to take place to rescue otherwise illicit movement structures.

The reason why (5b) is the expected as the interpretation of a wh-question is that it involves identical copies. The observed interpretation however involves featurally distinct elements, viz. an operator and a variable. Although the conversion of the two identical copies into an operator-variable structure is generally assumed in the literature (e.g. Chomsky 1976, 2007), it is never made explicit how it can be achieved, given that they are assumed to be featurally identical.[6,7] The same effect can be observed at the phonological side of grammar. When more than one copy is spelled-out, the spelled-out copies often get different phonological interpretations. Consider Vata, another language with true resumption:

(6) **àlɔ́** **√ɔ̀** **/*àlɔ́** lē sâká lâ
who he/ who eat rice Q
Who is eating rice?

(Koopman 1983, p. 167)

Repeating the wh-phrase leads to ungrammaticality; instead, a pronoun must appear. Again: given that the two copies are featurally identical, it is unexpected that they are spelled-out by non-identical elements.

The last problem is related to the second one, but differs slightly. What we've seen so far is that copies are interpreted as non-identical elements, even though they are assumed to be featurally identical. Looking closely at movement structures reveals the third property of copies. The copies higher in a structure contain more valued features than those lower in a structure.[8] Let's call this problem the *fixed-direction-problem*. This problem was already illustrated in previous examples. The feature specification of the resumptive pronouns in (4) and (6) is a proper subset of the feature specification of the moved wh-phrase: whereas the pronouns spell out only valued φ-features, the wh-phrase spells out valued φ-features plus at least a valued wh- and – in the case of Swedish – a valued D-linkedness-feature. The same subset-superset-relation gives the described semantic differences for (5): since no valued operator-feature is present in the lower copy, no operator interpretation arises for that copy. What about (3)? It seems to involve identical copies. However, consider the contrast in (7).

(7) a. *Ich glaube$_{[-wh]}$ [wen sie liebt].
I believe whom she loves
I believe whom she loves.

[6] More generally, this means that the CTM is incompatible with compositionality, as already noted by Cormack & Smith (2002).

[7] Notable exceptions are represented by the work of Danny Fox (1999) and Uli Sauerland (1998).

[8] Barbiers (2006) arrives at a generalization that states exactly the opposite; however, it is questionable whether the cases he considers are really instances of movement.

b. √**Wen** glaubst$_{[-wh]}$ du [**wen** sie liebt]?
whom think you whom she loves
Who do you think that she loves?

As can be seen from (7a), *glauben* prohibits an interrogatively marked complement clause, i.e. a [+wh]-marked clause. In wh-copying (7b) this selectional requirement seems to be overridden, as a clause introduced by a wh-element (*wen*) appears in the complement position of *glauben*. However, it's quite unlikely that selectional requirements can be overridden. What seems more likely is that the intermediate copy doesn't bear a [+wh]-feature.[9] Then no violation of the selectional requirements arises. Given that the [+wh]-marking of *wen* arises under a local relation with a relevant matrix C°-head, this in turn means that the highest copy contains one more valued feature compared to the intermediate copy, viz. the [+wh]-feature. Verb copying structures are even more telling. Consider an example from Hebrew, with the fronted verb receiving a topic interpretation:

(8) **Liknot**, hi **kanta** et ha-praxim.
buy she bought acc the-flowers
As for buying, she bought flowers.

(Landau 2006, p. 37)

Although two verbs appear in the sentence, they differ in one crucial aspect: the verb in initial position is rid of its selectional requirements (9).

(9) ***Le'exol** dagim, Rina xoševet še'ani **oxel** salmon
to-eat fish, Rina thinks that-I ate salmon
As for eating fish, Rina thinks that I ate salmon.

(Landau 2006, p. 45)

Given that the impossibility of furthermore selecting arguments is encoded via feature valuation (otherwise verbs would infinitely go on selecting arguments), this means that the higher copy has more valued features than the copies lower in the structure.[10]

Concluding so far, the CTM is empirically not well-supported. This seems to require giving up the CTM. In the next section, we show that this conclusion is premature and that the problematic data can be easily made compatible with the CTM.

[9] *wen* can be used also in non-interrogative contexts; cf. section 5. In addition, semantic interpretation supports this idea: the embedded clause in (7b) is not interpreted as an embedded question.

[10] We so far have no account as to what determines the form of the spelled-out verb in first position.

4. Deriving the Non-Identity Effects

4.1. The Mechanism

In this section, we will show that with standard assumptions about structure building, one can easily explain two of the three problems, viz. the fixed-direction-problem and the non-identity-problem. We will then argue that the trace-problem is just a special case, and can be subsumed under the non-identity-problem. Lastly, we will show that the data presented so far require rethinking the role the interfaces play for syntax.

Consider the following syntactic standard assumptions:

(i) Syntax manipulates syntactic objects; syntactic objects are lexical items[11] or elements build up from lexical items, i.e. phrases

(ii) COPY targets only syntactic objects (Lexical Integrity)

(iii) Different feature-types are valued in different domains; thematic features in the V-domain, wh-features in the C-domain, etc.

(iv) Feature valuation is strictly local, with local = under sisterhood

(v) Features of the head determine the label of a phrase

(vi) Once a structure is built, it cannot be altered afterwards (no backtracking)

(vii) Feature specification determines interpretation at the interfaces

Incorporating these assumptions, consider now a sample derivation for a lexical item *w* {x, y}, with x and y being unvalued features. Valuation will be indicated as ~~struck through~~; subscripted α on X is to be read as "X provides a value for α on some Z, Z ≠ X"[12]; subscripts on left brackets indicate the label of the bracketed string.

(10) a. Merge({x y}, $B°_y$)

b. $[_{By}$ {x y} $B°_y]$ → Value(y)

c. $[_{By}$ {x ~~y~~} $B°_y]$

d. $[_{Ax} A°_x$ ... $[_{By}$ {x ~~y~~} $B°_y]]$ → Copy({x ~~y~~}); Merge({x ~~y~~}, A_x)

e. $[_{Ax}$ {x ~~y~~} $[_{Ax} A°_x$ ... $[_{By}$ {x ~~y~~} $B°_y]]$ → Value(x)

f. $[_{Ax}$ {~~x~~ ~~y~~} $[_{Ax} A°_x$ ... $[_{By}$ {x ~~y~~} $B°_y]]$

Step (10a) follows from (i): Merge applies to syntactic objects, in this case $B°_y$ and {x y}, resulting in the structure (10b); by (v), the head B° determines the label of the resulting syntactic object. Given (iv), the

[11] This idea is not uncontroversial; it is not shared by syntactic proposals inspired by Distributed Morphology (Harley & Noyer 1999).

[12] For brevity, we abstract away from the features that make the attraction of Z to X possible in the first place. The idea that X provides a value for Z is not incompatible with a probe-goal system, given that Merge seems to always involve mutual feature exchange: Merge(V, DP) allows V to value its c-selectional requirements, DP values its thematic feature; Merge (T, DP) allows T to value its φ-features, DP values its case-feature; (Merge C, wh-DP) allows C to value its clause-type feature, wh-DP values its wh-feature.

relevant context for feature valuation is now available. By (iii), only one feature can be valued, in that case *y*, resulting in (10c). Omitting some steps in the derivation, we arrive at (10d), with $A°_x$ merged higher up in the structure. By (v), $A°_x$ will determine the properties of the phrase. Since the phrase labeled A_x has the relevant feature, {x ~~y~~} gets copied and merged; by (ii), only the whole item can be copied and merged. Valuation in (10e) proceeds again according to (iii) and (iv). Crucially, from (iii) and especially from (vi) it follows that the valuation of *x* can only affect the copy that is sister to the phrase A_x. (vi) additionally explains why copies higher up will contain more valued features than the copies lower down. The final structure (10f) will now contain two copies of *w* which will differ in their feature specification. By (vii), they will be assigned different interpretations, as abstractly shown in (11):

(11) {x ~~y~~} ↔ / § /
{~~x y~~} ↔ / & /

4.2. The Benefits

What we've done until now is to have shown that the data labeled as the fixed-direction-problem and the non-identity-problem are not problems for the CTM: they follow from independent properties of structure building. Firstly, copies differ in their feature specification because different features are valued in different positions, and feature valuation requires sisterhood. Therefore, the copies are non-identical, and the interpretative differences on the semantic and the phonological interface fall out naturally. (In the remainder of the paper, we will only deal with the PF-interface.) Secondly, the fixed-direction-problem is accounted for because backtracking is not possible. What about the trace-problem, how does it fit into this picture? Quite neatly, we'd like to suggest, given some reasonable ideas about lexical items. In most versions of minimalist syntactic theories it is assumed that a lexical item is triple of phonological, semantic, and formal features (Chomsky 1995, p. 230). We depart from that assumption. In our view, phonological features are not part of a lexical item. Why do we assume this? If phonological features were part of a lexical item, it is predicted that these features influence structure building. However, this prediction is not borne out; none of the following processes are attested among languages:

- a verb selects for elements beginning with /k/
- wh-movement is restricted to monosyllabic wh-words
- a preposition selects for elements with a trochaic stress pattern

All these effects, however, follow automatically from the idea that phonological features are not specified in lexical items, because under this

assumption syntax then simply can never make reference to them.[13] But then how do elements get their phonological features? We assume that grammar invokes at least two lexica.[14] One contains the lexical items with unvalued features; these enter the syntactic computation and get valued. The other one relates the lexical items with the now valued features with phonological features.[15] Syntax has access only to the first lexicon (the syntax-lexicon), the phonological interface only to the second lexicon (the PF-lexicon). When syntax hands over a structure to the phonological interface, the interface scans the elements in the syntactic structure for corresponding elements in the PF-lexicon. If it finds one, it inserts the corresponding element.[16] What if it doesn't find a corresponding element? Then it simply doesn't insert anything at this position. This is what we assume is happening in the case of traces: there is simply no corresponding element in the PF-lexicon for the element in the syntactic structure.[17]

This means that traces and spelled-out elements are not separate entities; they can be uniformly described. That some elements are not spelled-out basically follows from the arbitrary sound-meaning correspondence: zero phonological interpretation is simply a special case of differing phonological interpretation. Furthermore, copy spellout is syntactically guided; no post-syntactical PF decision procedure which copy to spell out is invoked (contra e.g. Bošković 2001). This not only reduces computational complexity – since no look-ahead is needed to determine which copy is spelled-out – but also predicts that PF cannot

[13] Cf. Miller et al. (1997), Pullum & Zwicky (1988), and Zwicky & Pullum (1983, 1986a, 1986b) for discussions of this principle and apparent counterexamples to it.

[14] We remain agnostic on whether semantic features are needed in lexical items or not, since we only deal with the PF interface here.

[15] This means giving up the independence of PF and LF from each other because to correctly pair the elements of the two lexica, PF must be able to take non-phonological features as input. Regardless of whether this is a bad result or not, note that a condition like "recoverability of deletion" (which most syntacticians assume) points in the direction that this independence is dubious in the first place.

[16] This idea is similar to the mechanism of lexical insertion in Chomsky (1965). In our view, the syntactic lexicon therefore is not only a list of idiosyncrasies but also a list of constant features in a lexical item (the type), whereas the PF-lexicon is a list of actual occurrences (the tokens). The task of syntax is therefore to assign values to underspecified lexical items.

[17] Why elements in base positions happen to be not spelled-out so often might be related to the issue of φ-completeness, i.e. one can only spell out elements that have a full specification of φ-features (cf. Adger 2008 who shows that at least in some languages resumptive pronouns are elements stripped off their φ-feature specification).
The semantic difference between a wh-phrase in base and final position results quite unproblematically: the wh-feature is unvalued in base position, so only a variable interpretation for the wh-phrase in that position will arise.

force additional copy spellout, it can only exploit it (we will come back to this point in the last paragraph of section 5).

4.3. Reconsidering Unvalued Features

However, our argumentation so far can only work if we assume that the interfaces can ignore unvalued features. But this again is not a standard minimalist assumption: a structure with unvalued features crashes at the interfaces, because they are by definition not legible at the interfaces. This was also the reason for assuming that copies are not allowed to differ in their feature specification (cf. the quotation from Epstein & Seely in section 2). We will depart here from the minimalist concept of unvalued features. Firstly, unvalued features in our approach are much more like unvalued features in HPSG, i.e. feature-types that lack a certain specification. In the course of the derivation, the missing values will be assigned under sisterhood with elements providing the relevant values. Secondly, given this concept of unvalued feature, no crashing derivation results if an element lacks a value.[18, 19] A missing value is then simply a missing feature specification in a feature bundle; but feature bundles are legitimate objects for the interfaces independent of the number of elements they contain. Now, under this perspective, it is not just the case that the existence of traces finds a natural explanation (those are elements in the syntactic structure that don't match an element in the PF-lexicon); it is also predicted that in the course of a derivation elements might get created whose feature bundles do match elements in the PF-lexicon, so that

[18] Giving up this idea amounts to giving up minimalism altogether. If syntax does not operate with features that are relevant only to the interfaces, but with a separate set of features that only partly match those of the interfaces, then the whole idea that language is an optimal system is untenable, because optimal means that syntax is shaped by and for the interfaces. If syntax employs interface independent features then syntax is obviously not shaped by the interfaces. That the minimalist conjecture seems to be wrong is not such a bad result, given that it is ungrounded in the first place. To turn it into an empirical hypothesis, one would need independently motivated properties of the interfaces. Otherwise, it is not clear what those interface conditions are that language has to satisfy. However, no such properties are known (Chomsky 1995, p. 222; Chomsky 2004, p. xii; Chomsky 2006, p. 121).

[19] If unvalued features don't cause crashing, then as a consequence structures containing only valued features have no special status compared to structures with unvalued features. It might seem strange to assume that a phrase like *did Fred put on the table* – without wh-movement and an empty element after *put* – is as grammatical as a full sentence like *Susan left*. However, if the task of a grammar is to account for the speaker's knowledge of his language (Chomsky 1957, 1975), then our system does exactly this. A competent speaker knows that in *did Fred put on the table* a *what* in initial position is missing; accordingly, a competent speaker knows that *love Mary* is a property of some unexpressed subject. A grammar, however, that treats both cases as simply ungrammatical does not fully reflect the speaker's knowledge about these structures.

multiple copy spellout arises. In the next section, we will argue that wh-copying is just such a case. Additionally, we show that specific predictions of our proposal for this construction are borne out.

To conclude this section, we've shown that the non-identity of copies, the superset-subset relation between higher and lower copies, and the non-spellout of some copies follow from standard assumptions about structure building, coupled with specific assumptions about the lexicon and the concept of unvalued features as unspecified feature-types. The CTM itself can be sustained.

5. Wh-Copying in German

Consider again example (3), repeated as (12):

(12) Wen glaubst du wen sie t liebt?
whom think you whom she loves
Who do you think that she loves?

Given the proposal outlined in the last section, we suggest the following structure for (12), irrelevant details omitted:

(13)

$[_{CP2}$ wen$_{[\sout{wh}\ \sout{Op}\ \Theta]}$ C°$_{wh}$ ... $[_{CP1}$ wen$_{[wh\ \sout{Op}\ \Theta]}$ C°$_{Op}$ ... $[_{VP}$ wen$_{[wh\ Op\ \Theta]}$ V_{Θ} ...]]]

The wh-phrase first gets merged as sister to some verb and values its thematic feature in this position (we abstract away from case here). It then gets copied to the intermediate C° and values its operator-feature there. Finally, it gets copied to the matrix C° and values its wh-feature. By the spellout rules in (14), the copies will assume their phonological specification:

(14) wen$_{[wh\ Op\ \Theta]}$ ↔ / Ø /
wen$_{[wh\ \sout{Op}\ \Theta]}$ ↔ / wen /
wen$_{[\sout{wh}\ \sout{Op}\ \Theta]}$ ↔ / wen /

According to this analysis, we make two predictions. Firstly, the different feature specification of the three copies can lead to three phonologically different elements. Secondly, the intermediate elements will show up in other contexts, too. As for the first prediction, since the three copies each have different feature specifications, we expect that for some speakers, this difference shows up overtly by having three separate elements for the three copies. This is indeed the case: for some speakers, wh-copying is grammatical only with a d-pronoun appearing in intermediate position.

(15) **Wen** glaubst du **den** ich gesehen habe?
whom think you this I seen have
Who do you think that I have seen?

Turning to the second prediction, we expect that the element in the intermediate position shows up independently of this construction. This prediction is also borne out. Elements with the phonological shape of a

wh-phrase show up also in non-[+wh]-contexts, viz. as indefinites (16a) and as pronouns in free relative clauses (16b):

(16) a. Ich habe **wen** gesehen.
I have whom seen
I have seen someone.
b. Ich glaube **wem** du vertraust.
I believe whom you trust
I believe who you trust.

According to our proposal, constructions like wh-copying can be explained without any additional assumptions about post-syntactic operations. We can also account for the asforementioned problem in the description of wh-copying as to why no special semantic or phonological effect can be detected in this construction. This is mysterious under post-syntactic accounts of copy spellout: to license a deviation from the general case of interpreting the highest copy, some additional interface effect is needed. However, there is neither a special intonational property related to wh-copying nor are there any semantic effects.[20] This, however, follows neatly from our purely syntactic account because copy spellout is only determined by the match between the elements appearing in a syntactic representation and elements appearing in the interface lexicon. Therefore, no additional interface effect to license multiple copy spellout is needed.[21]

We do *not* deny that there are cases in which multiple copy spellout is accompanied by interface effects; we only deny that those effects *cause* it. Consider, for example, verb copying in Nupe (Kandybowicz 2007). Kandybowicz shows that the additional spellout of the verb is accompanied by the realization of a floating tone that otherwise would be unassociated (hence, a PF-eefect). One might be tempted to conclude that this effect is therefore responsible for the multiple copy spellout. To do so, however, requires showing that *only* multiple copy spellout can achieve the interface effect, but no other option, like deleting the floating tone, associating it with following syllable, or associating it

[20] Pafel (2000) reports special scopal effects related to wh-copying. However, the informants I consulted do not agree on these judgments. Moreover, even if they were true, wh-copying is also found with elements that do not induce scope relations, like relative pronouns in relative clauses.

[21] We don't assume that successive cyclic movement is a necessary property of unbounded wh-movement; therefore, not every language with unbounded wh-movement is expected to have wh-copying. The details of this idea will be worked out in future work.

with a dummy element.[22] Otherwise, no strong point can be made for assuming that multiple copy spellout is *caused* by an interface effect.

6. Conclusion

One conclusion of this article is that the Copy Theory of Movement can be sustained. The other one is that the minimalist conception of unvalued features is untenable. It leads to insurmountable problems for correctly describing the behaviour of the copies at the interfaces. Assuming a non-minimalist conception of unvalued features, coupling it with the CTM and standard syntactic assumptions allows one to account for the behaviour of the copies at the interfaces. More specifically, it allows one to account for (a) the existence of traces and spelled-out elements, (b) the difference in the interpretations copies are assigned at the interfaces, and (c) the peculiar fact that copies higher up in the structure are featurally richer than those lower down. The predictions of our approach were illustrated with wh-copying in German

7. References

Adger, David (2008). *Bare Resumptives.* Ms., QMUL (ling.auf.net/lingBuzz/000709)

Barbiers, Sjef (2006). *Er zijn grenzen an wat je kunt zeggen.* Inaugural Lecture, University of Utrecht.

Bošković 2001. *The Nature of the Syntax-Phonology Interface.* Elsevier: Amsterdam.

Chomsky, Noam (1957). *Syntactic Structures.* Mouton: The Hague.

Chomsky, Noam (1965). *Aspects of The Theory of Syntax.* MIT Press: Cambridge MA.

Chomsky, Noam (1975). *The Logical Structure of Linguistic Theory.* Plenum Press: New York and London.

Chomsky, Noam (1973). "Conditions on Transformations." In: Anderson, Stephen R. & Kiparsky, Paul (Hrsg.). *A Festschrift for Morris Halle*. Holt, Rinehart and Winston: New York; pp. 232-286.

Chomsky, Noam (1976). "Conditions on Rules of Grammar." *Linguistic Analysis* 2(4): 303-352.

Chomsky, Noam (1993). "A Minimalist Program for Linguistic Theory." In: Hale, Kenneth & Keyser, Samuel Jay (eds.). *The View from Building 20.* MIT Press: Cambridge, MA; pp. 1-52.

Chomsky, Noam (1995). *The Minimalist Program.* MIT Press: Cambridge, MA.

Chomsky, Noam (2004). *The Generative Enterprise Revisited.* Mouton de Gruyter: Berlin.

Chomsky, Noam (2006). *On Nature and Language.* CUP: Cambridge.

Chomsky, Noam (2007). "Approaching UG from Below." In: Sauerland, Uli & Gärtner, Hans-Martin (eds.). *Interfaces + Recursion = Language?* Mouton de Gruyter: Berlin; pp. 1-29.

[22] Those processes are all attested: deletion of non-associated elements in phonology is discussed under the label of Stray Erasure (Steriade 1982), association of a floating tone to the following syllable occurs in Bambara (Leben 1973), insertion of a dummy element is exemplified by do-support in English (Chomsky 1957).

Cormack, Annabel & Smith, Neil (2002). "Compositionality, Copy Theory, and Control." *UCLWPL* 14.
Engdahl, Elisabeth (1982). "Restrictions on Unbounded Dependencies in Swedish." In: Engdahl, Elisabeth & Ejerhed, Eva (eds.). *Readings on Unbounded Dependencies in Scandinavian Languages.* Almqvist & Wiksell: Stockholm; pp. 151-174.
Engdahl, Elizabeth. 1985. "Parasitic Gaps, Resumptive Pronouns, and Subject Extraction." *Linguistics* 23(1): 1-44.
Epstein, Samuel D. & Seely, Daniel T. (2002). "Rule Applications as Cycles in a Level-free Syntax." In: Epstein, Samuel D. & Seely, T. Daniel (Hrsg.). *Derivation and Explanation in the Minimalist Program*. Blackwell: Oxford; pp. 65-89.
Fox, Danny (1999). "Reconstruction, Binding Theory, and the Interpretation of Chains." *Linguistic Inquiry* 30(2): 157-196.
Harley, Heidi & Noyer, Rolf (1999). "Distributed Morphology." In: *GLOT International* 4(4): 3-9.
Kampen, Jacqueline van (1997). *First Steps in Wh-Movement*. PhD, Utrecht University.
Kandybowicz, Jason (2007). "On Fusion and Multiple Copy Spell-Out: The Case of Verbal Repetition." In: Corver, Norbert & Nunes, Jairo (eds.). *The Copy Theory of Movement.* Benjamins: Amsterdam; pp. 119-150.
Koopman, Hilda (1983). "Control from COMP and Comparative Syntax." *The Linguistic Review* 2(4): 365-391.
Landau, Idan (2006). "Chain Resolution in Hebrew V(P)-Fronting." *Syntax* 9(1): 32-66.
Leben, William (1973). *Suprasegmental Phonology.* PhD MIT.
Miller et al. (1997). "The Principle of Phonology-Free Syntax: Four Apparent Counterexamples in French." *Journal of Linguistics* 33(1): 67-90.
Nunes, Jairo (2004). *Linearization of Chains and Sideward Movement*. MIT Press: Cambridge, MA.
Pafel, Jürgen (2000). "Absolute and Relative. On Scope in German Wh-Sentences, W-...W-Constructions Included." In: Lutz, Uli & Müller, Gereon & von Stechow, Arnim (Hrsg.). *Wh-Scope Marking.* Amsterdam: Benjamins; pp. 333-358.
Pullum, Geoffrey & Zwicky, Arnold (1988). "The Syntax-Phonology Interface." In: Newmeyer, Frederick (ed.). *Linguistics: The Cambridge Survey.* CUP: Cambridge; pp. 255-280.
Ross, John Robert (1967). *Constraints on Variables in Syntax*. Ph.D., MIT.
Sauerland, Uli (1998). *The Interpretation of Chains.* PhD MIT.
Sells, Peter (1984). *Syntax and Semantics of Resumptive Pronouns.* PhD, Amherst.
Sportiche, Dominique (2006). "Reconstruction, Binding, and Scope." In: Everaert, Martin & van Riemsdijk, Henk & Goedemans, Rob (eds.). *The Syntax Companion, Vol. IV*. Blackwell: Malden MA; pp. 35-93.
Steriade, Donca (1982). *Greek Prosodies and the Nature of Syllabification.* PhD MIT.
Thornton, Rosalind & Crain, Stephen (1994). "Successful Cyclic Movement" In: Hoekstra, Teun & Schwartz, Bonnie (eds.). *Language Acquisition Studies in Generative Grammar*. John Benjamins: Amsterdam; pp. 215-252.
Zwicky, Arnold & Pullum, Geoffrey (1983). "Phonology in Syntax: The Somali Optional Agreement Rule." *Natural Language and Linguistic Theory* 1(3): 385-402.
Zwicky, Arnold & Pullum, Geoffrey (1986a). "The Principle of Phonology-Free Syntax: Introductory Remarks." *OSUWPL* 32, pp. 63-91.
Zwicky, Arnold & Pullum, Geoffrey (1986b). "Two Spurious Counterexamples to The Principle of Phonology-Free Syntax." *OSUWPL* 32, pp. 92-99.